

CATJ

JANUARY

1978

OFFICIAL JOURNAL
OF THE
COMMUNITY ANTENNA
TELEVISION ASSOCIATION

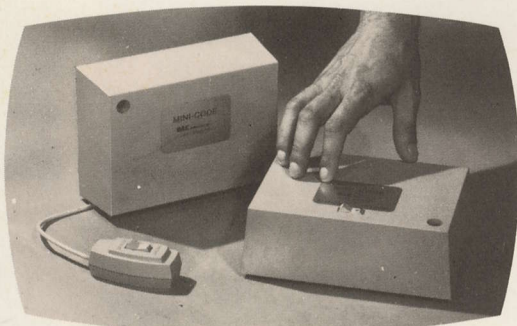


"Bob, I Still Think It Would Have Been
Cheaper To Get The Cable."

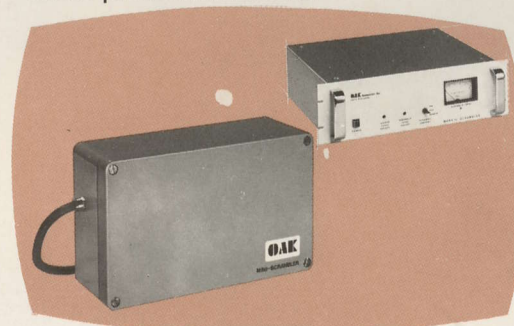
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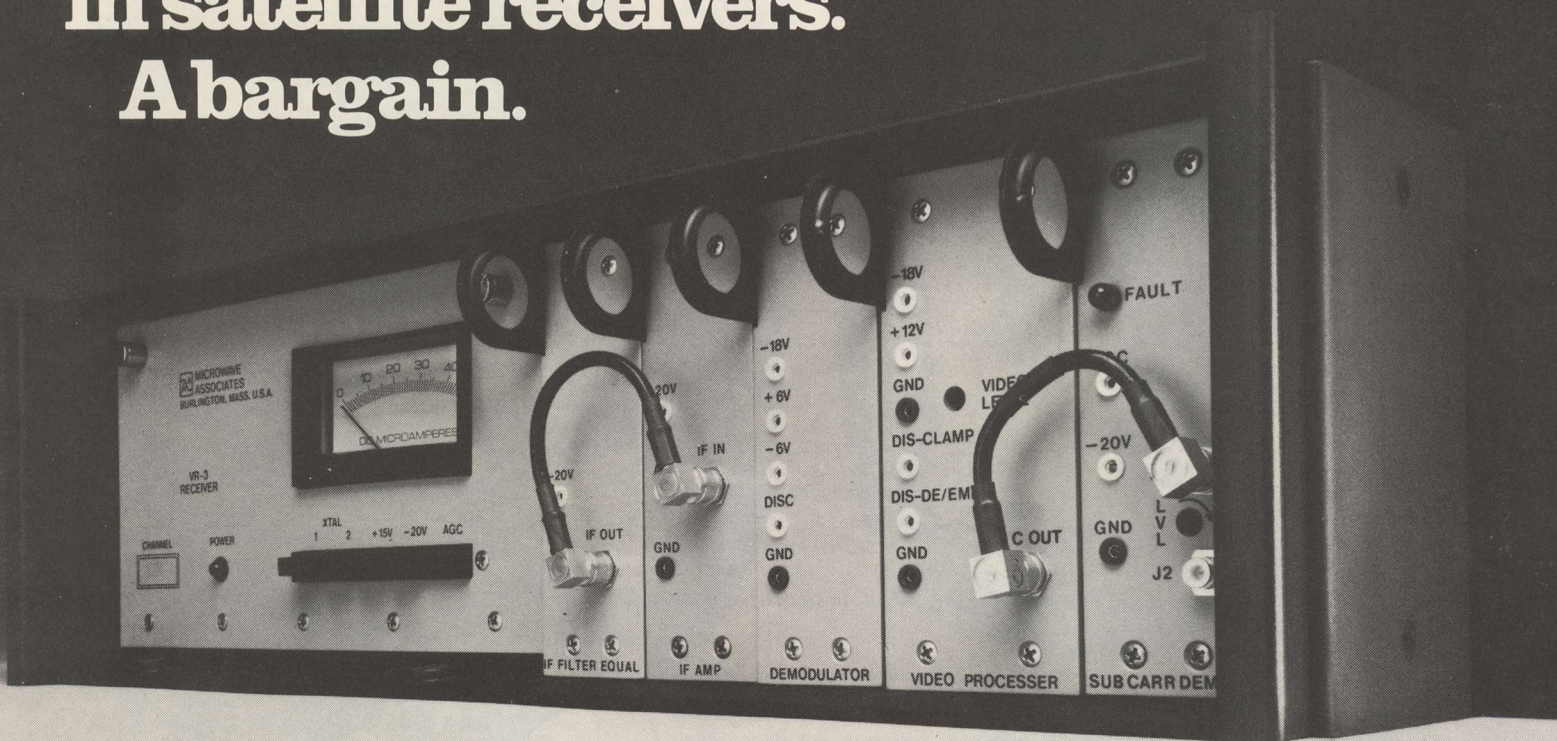
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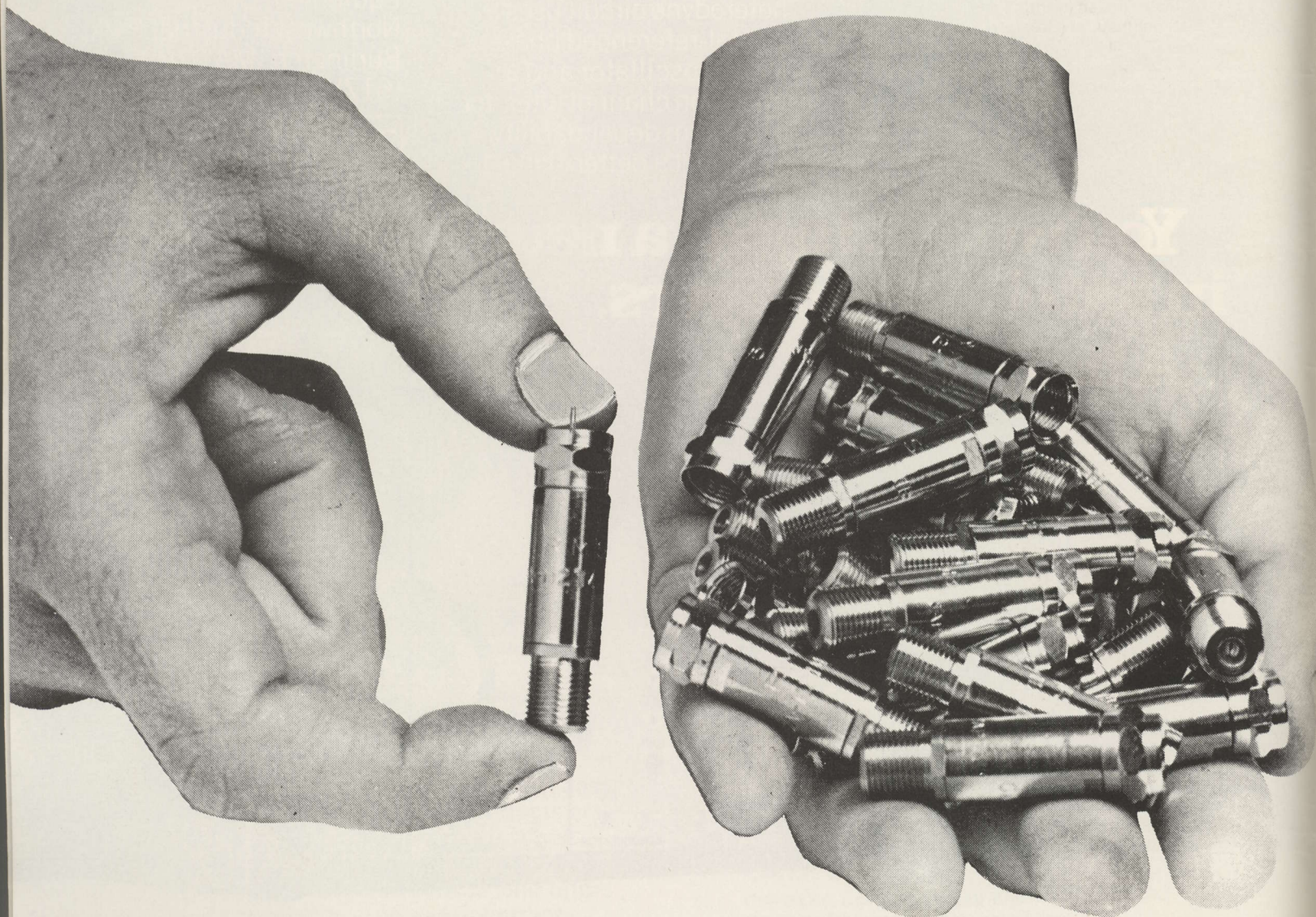
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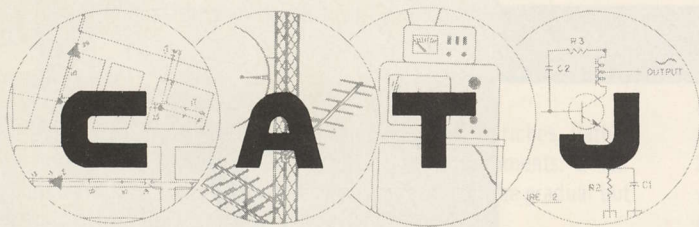
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ELECTRONICS, INC.

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JANUARY 1978

VOLUME 5 NUMBER 1

PUBLISHED MONTHLY, AS ITS OFFICIAL JOURNAL, BY THE COMMUNITY ANTENNA TELEVISION ASSOCIATION, INC., OKLAHOMA CITY, OKLAHOMA, AS A SERVICE TO ITS MEMBERS AND OTHERS PROVIDING CATV/MATV SERVICE TO THE TELEVISION VIEWING PUBLIC AND BROADBAND VIDEO/AUDIO DATA COMMUNICATION SERVICE.

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CATJ subscription rates \$12.00 per year for non-CATA members, \$8.00 per year for CATA member-systems; \$9.00 per year for industry employed personnel for at-home delivery. In Canada, \$13.00 per year for CATV systems, \$10.00 per year for system employees. Foreign rates upon request.

Third class postage rates paid in Oklahoma City, Oklahoma, U.S.A.

The Community Antenna Television Association Inc. is a nonprofit organization formed under Chapter 19, Title 18 of the Statutes of the State of Oklahoma. As such, no part of its assets or income shall be the property of its members; such assets and income shall be devoted exclusively to the purposes of the Corporation.

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—OUR COVER—

It may be cheaper, but it is not nearly as much fun! From an original cartoon sketch supplied by Doug Rasmussen of Hughes Microwave Communication Products, adapted by CATJ's Debbie Teel.

CATA "TORIAL

KYLE D. MOORE, President of CATA, Inc.



CATA's Growth

From the July 1973 founding of CATA to the present point in time has seen some of the most active years of this industry. This is no history lesson, so we won't dwell on the past. However, the development of CATA has been along basically conservative lines with crawling preceding walking preceding running every step of the way.

CATA's Oklahoma heritage expanded to include an arrangement with Washington Counsel in 1975; and since that time CATA's involvement in activities before the FCC, the Senate, the House and numerous other Washington-based groups has been extensive.

CATA was born in strife; at a time in this industry when Washington 'deals' were being made that often bargained away our futures. CATA's presence assured an independent voice for non-aligned cable system operators, and it has served as a 'check' and 'balance' to the largely Washington centered activities of NCTA. The system has worked very well but the time for such concerns may well be past as the industry heads into what appears to be a new era of understanding and cooperation.

When CATA first said **'the cable industry is in truth two separate industries, a master antenna service arm and a broadband cable communications arm'**, many (if not most) in the 'broadband cable communications' segment of the industry disagreed. Some were violent in their opposition. Yet time has proven the basic conceptual difference between 'community antenna' and 'broadband cable' to be valid. And today even powerful legislators such as Senator Ernest Hollings (South Carolina, head of the Senate Communications Subcommittee) recognize this conceptual and operating difference. During the November gathering in San Diego Hollings delivered a speech that noted:

"...in developing a regulatory framework (for cable) the differences between large and small markets must be recognized and the confusion, duplication and waste of cable regulation... must be untangled."

Of greater importance, Hollings also said:

"(in 1978) Congress will be taking a close look at the CATV industry. There is a growing consensus that the uncertain regulatory environment within which your industry must operate is not conducive to its growth. The cable industry needs a statutory mandate of its own right. Your industry provides more than an ancillary service to broadcasting, and it should not be regarded or regulated just as an incidental service. The 'ancillary' approach in the past has skewed the FCC's actions so they seem protectionist or biased towards industries more clearly subject to FCC regulation..."

Read all of this to mean that 1978 will undoubtedly see a considerably stepped up amount of attention towards and for cable in both the Senate and in the House. Read this to mean that the Senate may be heading, under Hollings' tutorship, for a piece of cable legislation that could be called 'The Cable Communications Act of 1978'. And read this to suggest that perhaps the House effort to re-write the **whole** of the antiquated 1934 Communications Act may be sidetracked during 1978 while Senator Hollings moves to

separate cable's unique problems from those of a complete re-write of the 1934 act.

The primary concern here is 'who is pulling the chain?'. Are the broadcasters so concerned with the rapid growth of cable-by-satellite and pay-cable that they feel they need special protection **now**, before the re-write under Congressman Van Deeren is completed? Have the broadcasters decided that they can't pull Van Deeren's chain so they are going over to the Senate for help? **Or**, is the Hollings promise to 'legislate a statutory mandate for cable' in 1978 based upon some deep conviction of the man that cable needs 'growing room'?

The danger in statutory legislation is that it can cut either way. It can provide growing room for cable, legislative language directing the FCC to leave us alone, or, it can codify the ageless fears of broadcasters who would like to see us shackled and chained for all time to come.

For the moment nobody but Senator Hollings and perhaps a few close associates can say for sure what is ahead. Taken at his word, we have a very busy year ahead in Washington.

Which brings me to the bottom line. Effective January 3rd CATA will have opened a full time office in the Washington, D.C. area. This office is being staffed by our former Associate General Counsel Steve Effros. Effros has assumed the title of Executive Director of CATA, a title held until this point by Bob Cooper. For the past four-plus years Cooper has carried a dual load of Executive Director and Editor in Chief of CATJ, operating from CATA's Oklahoma City office. Effros has done a superb job for CATA and the industry as a whole before the FCC, in the halls of Congress, and working on special projects such as the CATA-incited approval for the 4.5 meter TVRO terminals. And for the record, General Counsel Rick Brown will continue to hold his position.

Opening an office in Washington is a major, expensive step for CATA. It says that we **do** read the handwriting on the wall, that we **do** realize that the creation of 'statutory language for cable's future' could turn out to be the most significant event to affect this industry in its 30 year history. And it says that as 1978 unfolds, we will be broader based, and more able to respond to the Senate's approach to cable; whatever it may turn out to be.

The Oklahoma City operation is being pared down so that without a major increase in overhead CATA can operate from **both** fronts. Being freed of the Executive Director duties Cooper will have more time to devote to accelerating technical excellence in the industry in areas such as low-cost microwave and expansion of the TVRO program for cable. Effros, devoting essentially full time to CATA as the new Executive Director, will in turn be able to increase the amount of assistance to CATA member systems (some 650 now) from CATA's new Washington office facility.

The year ahead promises to be a busy one. There is no way we can escape the certain changes ahead. It behooves each and every operator to be prepared and willing to devote a portion of his own time, energies **and money** to work for common goals during 1978. Our futures, your own future, depends upon your willingness to

serve and support the industry as a whole. I sincerely hope you are up to it.

Tonight's On Us?

The HBO success story has not been one of rags to riches. Rather it has been a series of minor singular accomplishments, a fair number of false trails followed (and abandoned) and the gradual but steady growth that comes with persistent endeavor.

As they have grown their visibility has increased. With more than 800,000 pay cable subscribers now the visibility for pay cable product is beginning to become substantial. And every now and again it becomes very large.

December 13th is a case in point. As a marketing effort, HBO encouraged affiliates to 'cross-strap' their normally secure pay cable channel with a non-secure channel for the full day's HBO programming on Tuesday the 13th. They call it **'Tonight Is On Us'** and the idea is simple enough; let the non-pay-subscribers see what it is they are missing. HBO says that previous efforts of this type have produced from 1 to 3% new signups. When you are playing with 800,000 subscribers to begin with that is a healthy 'one-day' jump.

The December 13th HBO program schedule offered **'Ode To Billy Joe'** (the Bobby Gentry song of the same name asked a question, and the movie attempts to answer it), a **Helen Reddy** special from the MGM Grand Hotel in Las Vegas, and two **very-adult** movies; **'Network'** and **'Demon Seed'**.

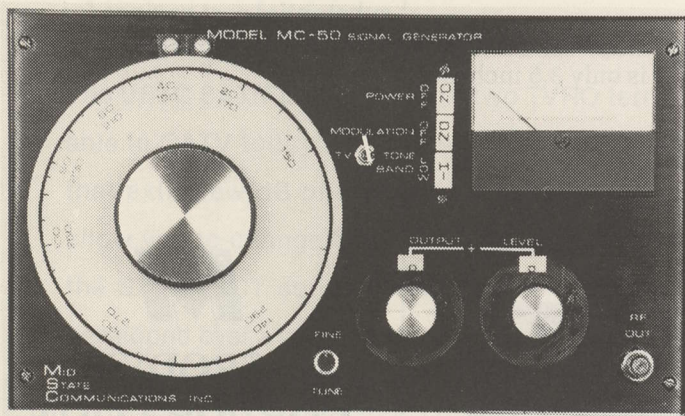
'Ode' deals with the suicide of a young man who throws himself from the Tallahatchie Bridge. The cause of the suicide is the movie's plot. It's PG rating suggests parental guidance. At 5 or 6 PM in the evening we suspect more than a few unwary parents who missed the 'Tonight's On Us' announcement might have been 'surprised' to find the basically adult theme on their living room tubes.

On the other hand many people are busy with dinner and winding down the day's out-of-home activities at that time and perhaps they didn't get to the TV until say 7/8 PM. **'Network'** began at this point and we can't help but wonder how many missed the notice until a station break between perhaps 'Happy Days' and 'Laverne and Shirley' caught them switching through the channels during a point where Faye Dunaway was romping (frontal nude) with William Holden in bed, or some of the delightful movie's frequent **hard-R** language was passing down the wire.

If Network's language didn't catch a few unwary viewers by surprise we suspect **'Demon Seed'** did. The plot of this 98 minute R rated epic is slightly outlandish; a supercomputer rapes (and plants a seed in) Julie Christie.

After all was over on the 13th, we wonder aloud whether systems who chose to cross-strap (and show without security) the HBO offerings on December 13th experienced any community problems as a result of the promotional efforts? How many indignant parents or offended senior citizens registered complaints with the cable office, or city hall after being subjected to the "surprise" showing of **'Network'** or **'Demon Seed'**? How many five year olds had questions for their mother or father which the parents were unready to answer?

We don't fault HBO for the effort; it makes good sense to show off the product. But the schedule of December 13th certainly left something to be desired. **Perhaps** pay-cable attracts 15% of homes passed nationwide **because** only 15% of American homes **want** uncensored language or Faye Dunaway's bare breasts in their living room. When **'consenting adults'** sign up specifically for the pay cable channel, they can be expected to know what it is they will be getting. But when the other 85% who did **not consent** suddenly find it in their living rooms...well, it just may be something this industry does not need. What do you think?



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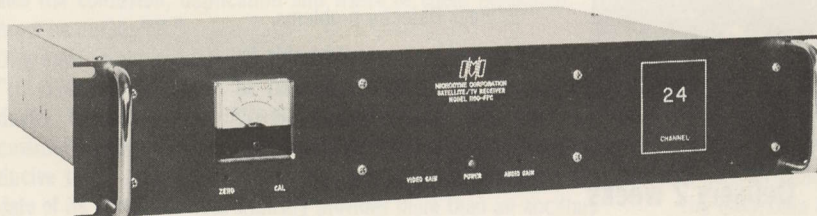
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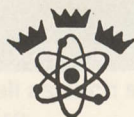
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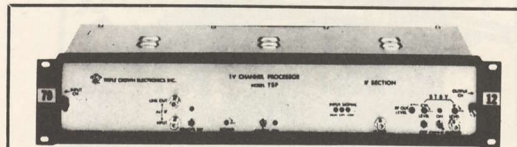
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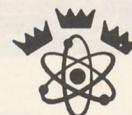


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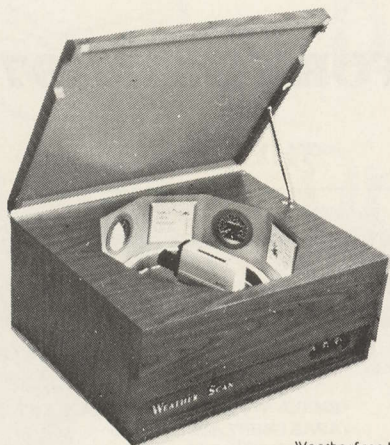
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*Patent Pending

SHOWTIME'S SATELLITE DELIVERED PAY CABLE PRODUCT IS AIMED AT THE INDEPENDENT CABLE OPERATORS

New Kid On The Bird...

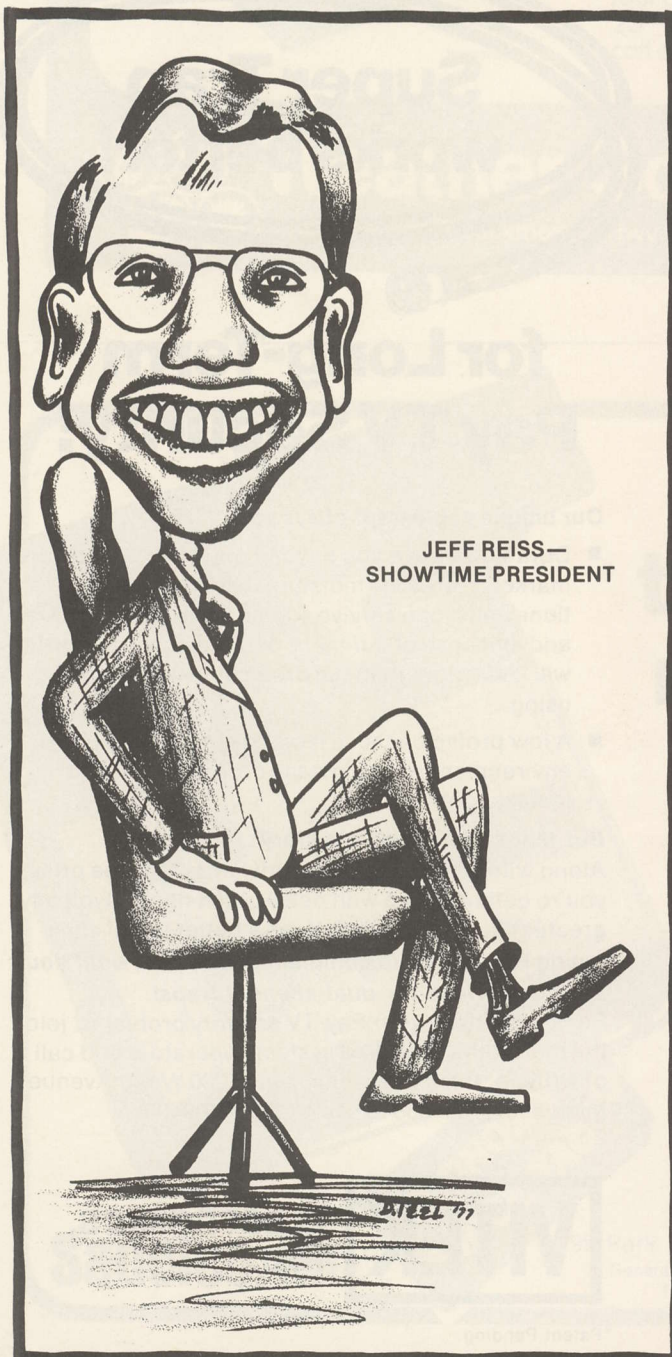
Perhaps many years from now the CATV historian will be able to properly measure the relative impact of a series of singularly important events on the development of cable-by-satellite. For now the recent past is still too close for an accurate analysis of the events of the past 30 months to properly place each event in some order of importance. For the record:

- 1) **HBO announced** they would be available by satellite delivery in the spring of 1975;
- 2) **A Mississippi** and a Florida system began satellite pay cable program delivery on September 30th of the same year.
- 3) **CATA proposes** and the FCC approves the use of smaller-than-nine-meter TVRO antennas in December of 1976.
- 4) **Atlanta's WTCG** gets FCC approval for common carrier delivery in December of 1976.

From that point forward the rest has been rapid growth and a blurring of statistics (see **Satellite Technology News**, this issue). At the risk of being overly optimistic, satellites are here to stay. And while there 'was' still room left on the 'prime bird' (SATCOM II) those who have serious designs to use the bird relay made their moves.

SHOWTIME is the latest **national** entry in the pay cable satellite arena. They are the newest kid on the block and they start as a distant second to the recognized leader HBO. Because HBO has been discussed and reported on over and over again, we felt there was a need to investigate in some depth the **SHOWTIME** format and the people behind it. HBO is gearing for reaching the 1,000,000 pay cable mark this year while **SHOWTIME** heads into satellite delivery with slightly over 100,000 pay-cable subscribers under its belt. The present subscribers are served from a video-tape base; no small accomplishment when you consider the complexities of getting out a quality tape product to more than 50 cable systems on a seven day a week format.

Our investigation took us to **SHOWTIME** President **Jeffrey (Jeff) Reiss** and **SHOWTIME**



JEFF REISS—
SHOWTIME PRESIDENT

Vice President **John Sie**. Immediately before joining SHOWTIME Jeff Reiss spent several years at the ABC television network as the man responsible for ABC acquisition of Friday and Saturday night network movies. His experience includes the production of off-broadway plays, program development for Norman Lear's Tandem Productions and a three year stint with Cartridge Television, Inc.; the first national effort to produce home video tape entertainment hardware and software.

Sie comes to SHOWTIME from Jerrold where virtually everyone knew John as **the man** responsible for sales activities relating to CATV products, CATV converters and turnkey systems. Prior to his Jerrold experience John was President of something called Micro State Electronics Corporation, a Raytheon division that manufactured microwave solid state devices for a wide variety of users including satellite systems.

All in all we put some twenty-three multiple part questions to Jeff and John. We'll cover the major points here this month and then schedule a part two followup after we've given the folks at HBO the opportunity for equal time.

As you will see, SHOWTIME comes out swinging. They make no bones about their needs to 'make it' with the 'independent cable operators'. As they note, HBO has pretty much sown up the likes of TelePrompTer, ATC and TCI. At least for now. For SHOWTIME to grow and be profitable on the national scale demanded by the satellite coverage will require two things of the firm:

- 1) A willingness to work with many different companies and many different operators who together will probably not even begin to total the exposure HBO gets with just their TelePrompTer (or ATC or TCI) relationship, and,
- 2) Some pretty fancy footwork to make their their product appealing to (hopefully) a higher percentage of the homes passed than HBO is currently able to commandeer.

Sie on SHOWTIME's appeal to the so-called 'independents':

"We have structured our rates to help the small independents. Our discount structure (i.e. discounts for customer quantity) begins at a much lower level that comparable published HBO rates so that affiliates with a small number of systems can see a meaningful rate drop".

Reiss on the same topic:

"We are aware that this is our market in the coming months and years. We feel that HBO felt that for SHOWTIME to enter the satellite distribution aspect of this business we would need the commitments of the large MSOs. They did not perceive, as we do, that the cable industry is really made up of small cable (system) operators. It is our confidence in the independent operators' desire for a quality pay-cable product that led us to make

SHOWTIME QUICK-FACTS

Company	SHOWTIME Entertainment Inc.
Address	1211 Avenue of the Americas New York, N.Y. 10036
Telephone	202-575-5175 800-223-0646
Officers	Jeffrey C. Reiss, President Jules Haimowitz, VP John Sie, VP
Service	Pay cable channel via tape, expanding to satellite 3-78.
Satellite	SATCOM II, transponders 4 and 10
Uplink Programming	Vernon Valley, N.J. (RCA) 7-12 hours per day (weekends expanded schedule)
Transponder Use	4 (eastern, central); 10 (mountain, pacific plus Hawaii)
Subscriber Base	100,000 (+)
1-1-79 Projection	300,000



JOHN SIE—
SHOWTIME VP



the \$7,500,000 agreement with RCA for the next six years."

Sie again.

"If we have the support of the small independent operators we feel very comfortable with our commitment. And I believe it will be healthy for the industry to have a competitor in the market. Everyone will benefit."

Reiss again.

"HBO's rate structure has discriminated in favor of the large operator and (because) they have to make it up someplace, (the small operator ends up paying more). We feel SHOWTIME may turn out to be the salvation for the independent operator interested in offering pay cable."

Fighting words perhaps. And they are bound to bring a response from HBO. As we feel certain HBO would point out if they were sharing the same page at this point, little Edna, Texas (500 basic subscribers) joined the HBO family this past December 1st. With its own TVRO yet.

If SHOWTIME's Reiss and Sie see their product as the salvation of the independents, their views concerning their programming approach are even stronger. They plainly believe they are (1) different from HBO, and, (2) they offer less but they do it better.

Reiss first on programming balance, movie selection, and scheduling.

"SHOWTIME has a first run philosophy. Each month we put on only new motion pictures and specials that have not previously been shown. We do bring back previously run movies from time to time, but at the most this is one or two within a month and then only after it has been off the SHOWTIME schedule for at least six months. More often it has been off nine months to a year. This is a dramatic departure from the Home Box Office philosophy of repeat programming month in and month out. They may present more per scheduled month in terms of offerings, but in terms of first run presentations they offer no more and perhaps less than our 14 new features per month."

The point is this. HBO offers more different movies, specials and proprietary shows in a month than SHOWTIME. But according to Reiss HBO brings along no more and perhaps fewer new movies or specials a month than

SHOWTIME. You might wonder why 'fewer is better'.

Sie on why they feel this is important to the cable operator.

"When people first sign up for pay cable everything they see in the first month is new. Then by the end of the second month they are opening their program guides and seeing more and more offerings that they have already seen, or turned down as not worth watching. By the time a pay cable subscriber gets to the fourth month of repeats, his 'perception of value' is that he is no longer getting what he first got, and he feels the value of the service has gone down. We think this 'perception of value' is a key element in getting and retaining pay cable subscribers. Repeat programs tend to have a negative value; they make people think 'hey, this pay channel may not be such a hot deal after all'."

And Reiss again.

"We work very hard to give the customer a concentrated, exciting impression of our product. Each month we focus on 14 new attractions. A program service that offers 40 odd programs to select from during the month, of which say 12 or 13 are new, suffers from 'clutter' and a lack of focus on the new programming. This is the major distinction between SHOWTIME and Home Box Office."

If that sounds like a man who works at a major network, keep in mind that Reiss is a graduate of the ABC network school of success. The part he played (while at ABC) in gaining for the network eight of the top ten rated TV movies in the 1975-76 season suggests that even if you don't understand everything the man says, you'd better follow him because he knows where he is going.

The name of the game is retention. HBO went through a rough period around a year ago. Plenty of people were signing up for the service, and then after a few months, they'd drop off. Perhaps, as Reiss suggests, "the customer's perception of value is clouded by the clutter of repeat showings". On the other hand, if Reiss is right and HBO's repeat-repeat-repeat philosophy is the cause of some of the marketing problems HBO admits they have had...how does HBO get off that bandwagon? Can you imagine the reaction of 800,000 plus pay subscribers if HBO suddenly switched from their 40 odd offerings per month to a lesser number, such as SHOWTIME's 14 or 15? Once on the train, you've got to ride it until it stops. Reiss claims to have numbers which indicate the SHOWTIME philosophy is the right one.

"The latest industry data (Paul Kagan's June 30, 1977 report which admittedly is due for an overhaul) indicates that SHOWTIME is taken by 12.4% of the total homes passed while HBO is taken by 10.8% of homes passed. SHOWTIME averages \$9.17 per pay cable subscriber while HBO averages \$8.23. Our experience has been that after initial market-

ing, one or two things occur; either we have no perceptible loss in customers, or in the worst case perhaps as much as a 15% loss. If there is a loss, after three months it starts back up again and our net average is that after one year we have a 90% retention."

As HBO has found out retention is the name of the game. Retention of the people who sign up for the service. Much has been made of something called the 'churn factor', or the turnover in pay cable subscribers. Systems in the HBO camp have found there to be a fair amount of churn or 'musical drops'. Reiss suggests SHOWTIME has had much less of a problem with this aspect of pay.

John Sie on retention:

"The critical point in the HBO service occurs at the three or four month point into a subscriber's tenure. This point does not occur with the SHOWTIME service. For example in Cleveland at the end of a 90 day period we have around 3,000 SHOWTIME subscribers with only 18 dis-connects."

The case for SHOWTIME's programming approach sufficiently belabored, let us move on to SHOWTIME's approach to programming selection. Movies of course make up the bulk of the fare for both satellite distributed pay cable services. SHOWTIME says that they attempt to select the movie fare so that the premium channel service has a broader appeal to all ages of viewers. Comparing relative merit of two different program schedules is risky at best. If one takes the SHOWTIME subscriber guide for November and the HBO subscriber guide for the same month, you find 46% of all movie features on SHOWTIME are 'R' rated while over at HBO 52% are 'R' rated. The SHOWTIME claim to broader appeal is a tenuous one at best (and that assumes the movie rating system is an acceptable measuring stick...which most would argue it is not). HBO in response might well point to their non-movie features such as NFL Report or College Basketball, or Skate Canada as being very PG. And we suspect that SHOWTIME might respond that HBO's Standing Room Only series (SRO) is often 'very' R. Nobody will win this argument. At least not using the November 1977 respective program guides as measuring sticks.

HBO introduces ('premieres') new program offerings on Fridays and weekends. About which John Sie comments:

"We do not have a fixed premiere date such as Friday or Saturday or Sunday. We place our premiere at the weakest time of the network(s) offerings, by time and date, to optimize the viewer's probability of watching the premiere; and therefore (enhancing) his perception of the proper value of the service."

Jeff Reiss on how well this plus their selection process works:

"We have found that out of our monthly lineup the average viewer will watch between 8 and 10 of our offerings. From what I've read



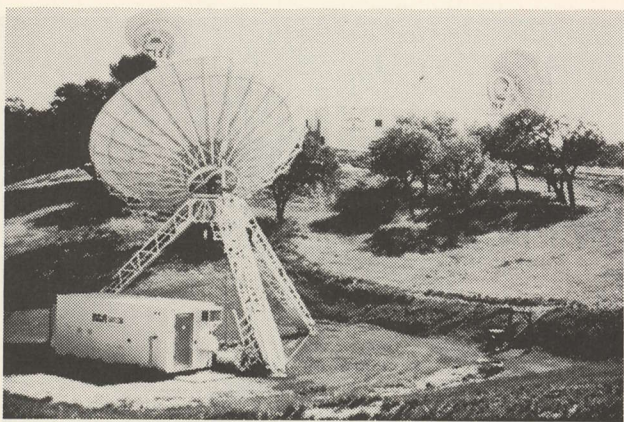
about competitive services including HBO and TPS and Bestvision and Optical they average between 4 and 5 per subscriber per month. I believe our higher viewing (i.e. that perception of value again) is attributed to our scheduling, our concentration of first-run movies, and our larger and more colorful (program) guide."

SHOWTIME spends considerable time extolling their approach to the subscriber **program guide**. Their claim to being bigger is a matter of interpretation. The guide itself measures 6.875" wide by 7.625" high resulting in 52.42 square inches of page surface. HBO's by comparison measures 5.125" wide by 6.75" tall with 34.59 square inches of page surface. (TV GUIDE by comparison is lightly larger than HBO; measuring 5.125" x 7.375" for 37.57 square inches of page.) If one is looking for the best, most convenient format size you'll find arguments going in all directions. Any home that has ever attempted to keep track of a **TV GUIDE** for a full week to ten days knows well how easy it is to mis-place the smaller format. But there is more to size than page surface area. HBO's November guide contained 24 page surfaces or a total of 830.16 square inches of display space. The SHOWTIME guide on the other hand had 16 pages for a total surface area of 828.72 square inches. Seemingly if there is a 'comparison' here both sides can claim a win; it all depends upon what your measurement criteria is!

SHOWTIME does do one thing with their guide which apparently HBO does not or cannot do. John Sie explains:

"In SHOWTIME's guide we offer two areas where the guide can be customized for the specific cable system affiliate. The inside front cover is for a letter from the President. Then in the body of the guide we have a section for letters to SHOWTIME. On both of these pages for a nominal charge the local affiliate system can have their own message, their own identity and their own logo. Letters from their own subscribers can be carried on the letters page. This results in a very slick, national full-color guide with a strong local identity."

Jeff Reiss picks up on the guide and the image the service attempts to convey:



RCA'S VERNON VALLEY up-link site will be utilized by SHOWTIME to connect with transponders 4 (eastern and central zones) and 10 (mountain, pacific and Hawaii with spot beam).

"Our SHOWTIME product is much more clearly defined as a program service than any other pay cable service. It is easy to explain to a potential customer. It is new movies and specials run within a single month with a new lineup each month. It is a self-marketing service. Our program guide is timed with the bill at the end of the month so that a small operator does not have to worry about retention, re-marketing and maintenance-marketing. The program service itself, coupled with the guide, maintains the marketing for the service."

The overall impression of the SHOWTIME guide is that it creates (in our view) a less difficult chore for the person who is attempting to make a viewing decision. By highlighting each of the new week's offerings on the same two page layout that gives the schedule for that week, there is considerably less flipping back and forth from page to page looking for 'background' on a particular movie than with the HBO guide. On the other hand, when you run 3 times as many offerings (as HBO does) the guide is bound to become more complicated. So much for guides.

SHOWTIME has been widely quoted as preparing to go into production with a news program similar in concept to (they say) 'Sixty Minutes'. And at the same time HBO, with its 800,000 pay subscriber base, has been producing more and more in the special-for-pay-TV area. It appears that as the pay subscriber numbers continue to grow there will be more and more 'product' available on pay that simply is not available elsewhere. Our initial reaction to the 'similar-to-'Sixty-Minutes' program concept was "Is this not very expensive programming to produce", and the bottom line, "this type of programming has never had much mass appeal".

Jeff Reiss on their plans:

"What we will be doing will be more along the lines of candid documentaries as opposed to news features. We will concentrate on

taking close looks at areas in American life; areas where commercial TV has simply not allowed itself to go. It will be in an entertainment format, not a news format. We are concentrating on finding whole new areas of programming that have been untouched to date. Only time will tell what will evolve."

There are of course dozens if not hundreds of American cultures and counter-cultures out there to be explored. We recall dialing up CBN one night in September and catching a 30 minute 'documentary' on San Francisco houses of prostitution. After our initial shock of finding it on CBN we settled back for one of the more interesting and entertaining 30 minutes we had spent with a television set in some months.

Reiss again.

"Up until now pay cable entertainment specials have concentrated on Las Vegas shows and east and west coast entertainment. I believe there is a whole range of mid-America which has to date been untouched by television, including pay cable."

John Sie adds:

"For example, the 'Jamboree In The Hills' is one of the largest gatherings of country and western performers in the nation and it's now scheduled to run on SHOWTIME in 1978. There are several additional country and western specials built around gatherings such as this scheduled for 1978. We'd like to satisfy not only the two coastal extremes but all of mid-America as well."

And Jeff again:

"That's also because we believe that the people on the two coasts will enjoy the programming out of mid-America. I don't think of this as specialized programming for a specialized segment of our audience. Our plan is to mix entertainment specials with first run movies. However for the next few years I believe the feature films will outweigh the entertainment specials."

Going out and producing specialized programming for pay cable costs money. One would suppose that perhaps what is evolving is not simply programming that will be seen **exclusively** on pay cable, but rather programming that will be produced for **first showing** on pay cable, **and then** released later to either domestic or foreign television showing. Can a 100,000 subscriber base for pay cable afford entertainment specials?

Jeff Reiss:

"The answer is yes. Our present 100,000 pay subscriber base is projected to grow to 300,000 by the end of 1978. That is sufficient to support program production but we won't be necessarily doing it in house. Columbia Pictures, Warner Brothers, Twentieth Century-Fox and Universal have all expressed an interest in the creation of original made-for-pay-TV programming. We could, just on the basis of programming production now scheduled for 1978, be running two or three specials

each month without originating any product of our own."

To which John Sie adds:

"SHOWTIME is drawing upon the total universe of the creative community to utilize all of the talent available to produce specials. By not keeping our own expensive staff on hand to do this work I believe we end up with a more creative mix of offerings."

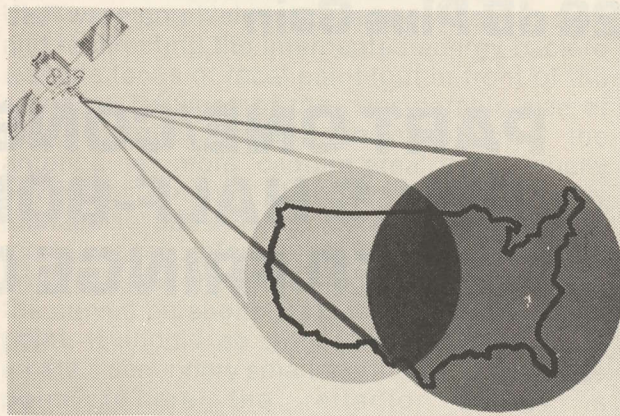
And Reiss:

"We are following the (proven) network philosophy of funding original and creative ideas from the entire production community. We are not limiting it to Hollywood or New York; rather we are drawing from places such as Nashville and Memphis, Atlanta and Chicago, and Dallas. We think this will create a much greater diversity of programming."

Well now, the FCC and the MPAA's Jack Valenti should like the sound of the last comment. "Diversity of programming." For years the cable rule makers have been espousing 'cable's promise' as being 'program diversity'. And the motion picture people have been just as vocal with their support for an 'unfettered pay cable market'. The time, it would appear, may well be coming.

There has been some confusion about the 'switchover' from SHOWTIME's present tape feed network and the delivery of service via satellite. As noted in box form elsewhere, SHOWTIME plans a start up on transponders 4 and 10 in March of this year. The official start-up date is dependent upon the completion of a now-under-construction new video production/playback facility at the RCA Vernon Valley 'site' near New York City. RCA is building a facility for earth terminal uplink users and the facility will have the latest generation of 2 inch quad tape playback units, editing and other production capabilities. Whereas the HBO signal starts off in mid-town Manhattan and runs through a 17 (cable) amplifier string and then into microwave to make the path to the Vernon Valley site, SHOWTIME will be starting at video at the uplink site itself. As John Sie points out, the Vernon Valley site has its own emergency power equipment and therefore 'brown or blackouts in Manhattan will not put SHOWTIME off the air at Vernon Valley'.

The transponder selection may work to the advantage of smaller terminals in some portions of the country. As the footprint maps in **Coop's Cable Column** this month indicate, HBO's two transponders (20/24) share a common footprint whereas transponder 10 (SHOWTIME west coast channel) has an accentuated beam for the west while transponder 4 (SHOWTIME east and central) has its accentuation in the east/central zone. In addition to this, transponder 10 has a special 'spot beam' which covers the state of



Hawaii (this spot beam is shared with transponders 2, 6, 14, 18 and 22). John Sie sees this as opening the 50th state to satellite delivered pay cable programming.

There has been some discussion amongst non-affiliates that when SHOWTIME went onto SATCOM II that the tape fed systems would be given some period of time to convert over to terminal reception. **"Not so"** says Jeff Reiss **"we made a commitment to our affiliates for tape delivery and we'll keep it up for as long as they want it"**. Most of the affiliates do plan to be converting over however and 14 brand new terminals are scheduled for installation as a result of the initial mid-March cut over date of the transponder service. For this the terminal suppliers thank the SHOWTIME folks.

HBO this fall began a program of providing a 'package' of assistance to new entrants to the TVRO business, who will be utilizing HBO's pay cable service. John Sie comments:

"We definitely will assist our affiliates with the processing of TVRO construction permits, follow through with the FCC, and provide technical assistance where required. One additional thing which parallels CATA philosophy is to see whether we can form a buying/leasing arrangement where the small independent can enjoy a volume discount such as the MSO's are enjoying."

There is of course more to the SHOWTIME story, but we'll save it for a more appropriate editorial position. Things such as delivery to non-U.S. destinations, the SHOWTIME written contract versus the HBO written contract, the 'conversion' of HBO affiliates to SHOWTIME affiliates and the question of providing pay channel service to 'public places' such as bars and clubs will all have to wait for another forum.

We are of course indebted to SHOWTIME with Jeff Reiss and John Sie for granting us this opportunity to look into their new satellite delivery service. A similar invitation has been extended to the Home Theater Network and FANFARE. A look at the HTN program for 'piggy back' delivery through transponder 18's next summer start of San Francisco's KTVU will appear in these pages in February.

PART ONE/CONSTRUCTION OF THE FRIAS HALF-BOLIC ANTENNA FOR DEEP FRINGE CATV HEADENDS



TONY FRIAS—in Ensenada office.

The Frias Half-Bolic Antenna

The November (1977) issue of CATJ reported in some detail on the progress being made by the Mexican CATV industry. Central to the theme of that report was the great care Mexican CATV engineers use to provide very high quality signals to their subscribers. One such engineer, **Ing. Antonio Frias Ramirez**, has designed and built a modern day reasonably low cost version of the 'Dew Line' type half parabolic antennas that were in such wide useage in the southern portion of Canada in the 1960's.

Frias has combined a rare attention to electronic design excellence with good mechanical engineering. His antennas, which CATJ visited in October of this past fall, are well built and they perform superbly. As multiple-channel signal-catchers they are extremely cost effective. And they have the added blessing of requiring less land than 300 foot (or taller) towers, being less expensive to install and maintain, and on the bottom line, **around 11-12 dB more gain capable** than even a first rate 'quad-stack' of large yagi or log antennas.

Tony Frias originally presented a technical discussion of his antenna system at the Cuernavaca convention site of the Mexican CATV association in June of 1975. Subsequently he penned copious notes as more of the antennas were constructed, tested and put into service. We have taken all of his notes, his 1975 convention presentation and after translation from Spanish to English, we put this three part series together. This series will carry part two in the February CATJ and part three in the March issue.

dB for dB

How do you know when your system receiving antenna is not big enough? **When** it doesn't produce adequate signals or an adequate fade margin to satisfy your engineering objective or your customers.

How do you know when it is too big? **When** it falls down in the winter.

There is an old adage in antenna circles that if your antenna survives the winter it is not big enough. In the **real** world of CATV signal delivery, your antenna seldom if ever is too big; but many are not big enough. That's what this is all about. Big antennas. Antennas that produce as much gain as a 'stacked array' of 128 cut-to-channel yagi antennas (all stacked for the same channel of course) when the basic yagi has 12 dB of gain. That's alot of antenna. But it can be designed and installed in such a way that it will perform properly, and stay up. Which is the bottom line for virtually all CATV systems; to make the pictures so good, and reliable, that the customers simply never want to leave the service to return to their own private rooftop antennas.

The technology behind 'half-bolic' antennas is neither new nor black art magic. It began in Canada in 1957 when a man named Stan Hosken in North Bay, Ontario created first a 30 foot rotateable parabolic for VHF reception, and then spurred on by his results created the first CATV adaptation of the famous 'Dew Line Parabolic' antenna in 1963. Hosken holds a Canadian patent for his work (Canadian patent number 728748) and dozens (if not hundreds) of copies of his work dot the landscapes all across southern Canada, and elsewhere around the world where television signals must be hauled a great distance.

This series of articles (three) are based upon work done in the past couple of years in Mexico by one Tony Frias of VICA Cable in Baja California. Frias has updated the art of the 'half-bolic' by utilizing commonly available labor and materials to produce a series of large (120 feet wide by 60 feet high) Dew-Line type parabolics.

Frias and VICA Cable utilize these antennas to bring United States television signals south into the interior of Baja California, below San Diego (see **CATJ** for **November 1977**).

Frias, like any cable operator anywhere, wanted to provide the best possible signals to his subscribers. And he wanted to do it with a professional, one-time installation that would not require expensive maintenance or create signal outages due to antenna system failure. He also wanted to do it for as little money as possible. **And that was his challenge.**

We'll assume here that you are familiar with VHF and UHF wave propagation theory (see **CATJ** for **September 1974**, page 42; **October 1974**, page 7; **January 1975**, page 7; **October 1975**, page 10; **May 1976**, page 12; **June 1976**, page 35), and that you understand the **one** basic principle of 'beyond the horizon' reception. Which is:

- 1) That **unless you can elevate the receiving antenna to a height where the antenna comes into the 'radio line of sight' (direct) path to the transmitting antenna, height buys you very little in the way of signal level enhancement. Conversely, height does buy much more pronounced co-channel interference problems.**

With that much said, we are ready to accept the well proven principle that a **large** antenna **close** to the ground is superior to a **smaller** antenna well **above** ground when the path from transmitter to receiver is so long as to place the receive site **beyond** the direct path for the transmitter signal. This assumes only that the location of the receive antenna is such that there is no **immediate** shielding of the antenna from the 'visual horizon' towards the transmitter(s).

Frias puts this well understood (but seldom practiced in the 1970's) technology to work using the care of a properly trained electronics engineer and the skill of a very practical mechanical engineer. The result is a series of antennas, documented here in considerable detail (both the successes and failures) so that others who find themselves 'beyond the radio horizon' can duplicate his results. And because his data is so complete and precise, those who follow will not be subjected to the tedious trials and errors which any new innovation must experience.

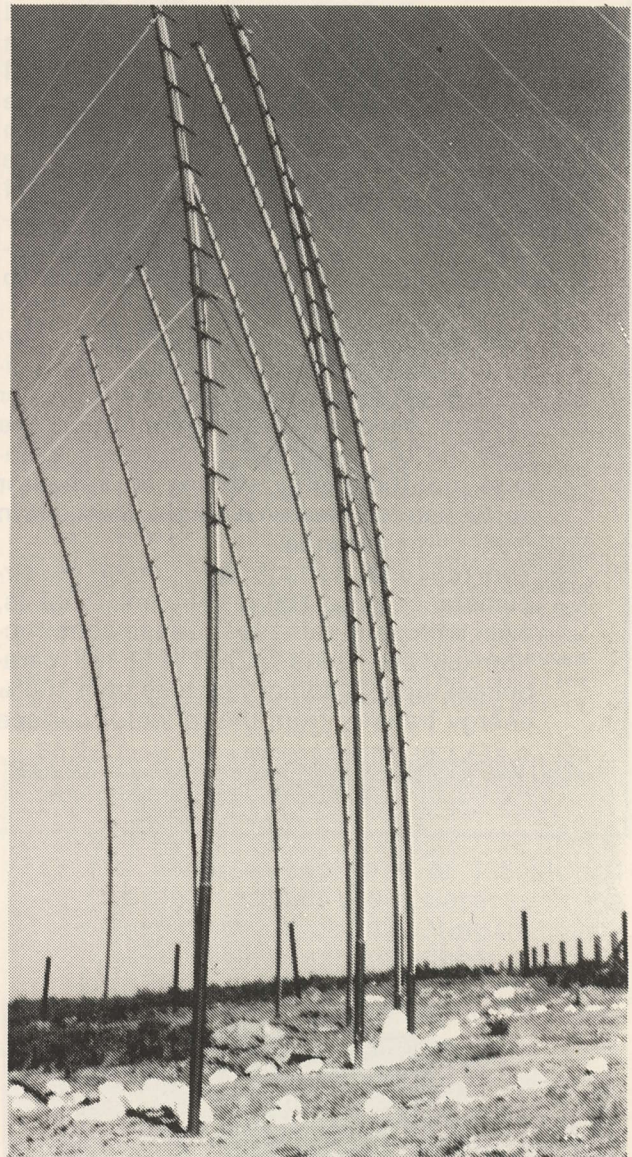
Pipe and Lashing Wire

The materials required to construct a 'Frias-Bolic' are readily found in most areas. Until they are fabricated into the specific design detailed here, they are (for the most part) not 'CATV' nor even 'antenna system' components. This perhaps contributes to the overall reduction in price. We'll talk more about costs shortly.

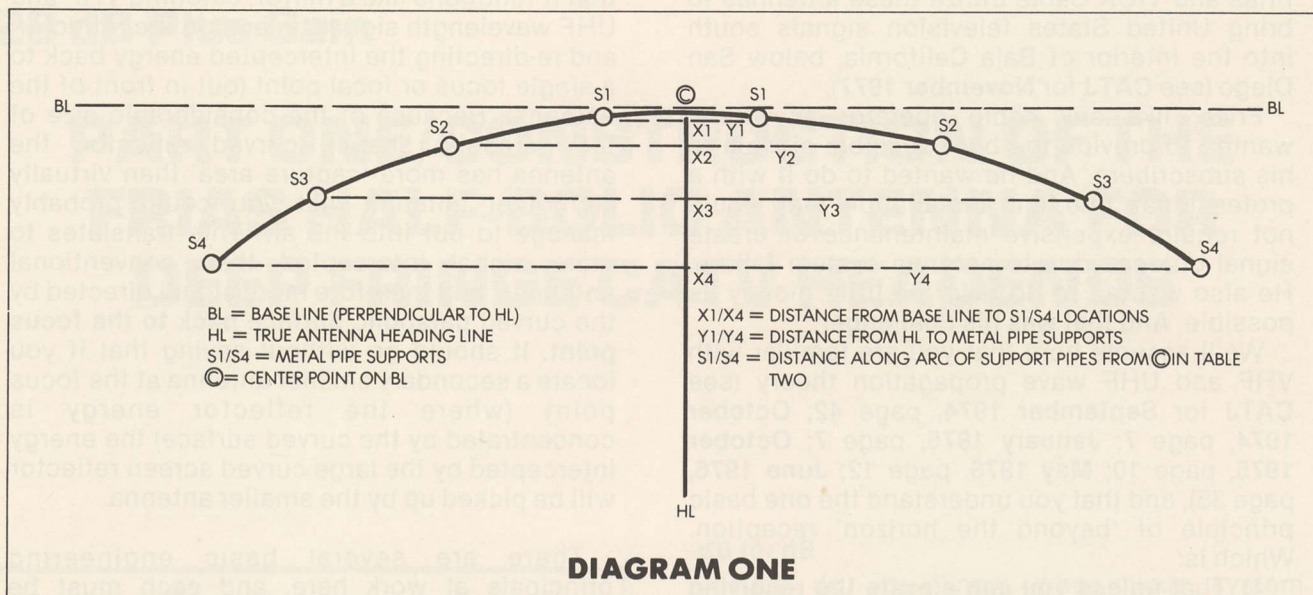
The principal is that a carefully designed curved surface acts as a reflector of radio/television waves intercepted by the antenna surface. The antenna is designed so

that it functions like a mirror, catching VHF and UHF wavelength signals in and on the reflector, and re-directing the intercepted energy back to a single focus or focal point (out in front of the antenna). Because of the considerable size of the parabolic shaped curved reflector, the antenna has more 'capture area' than virtually any other antenna that you could probably manage to put into the air. This translates to more signal intercepted than conventional antennas, and therefore more signal directed by the curved parabolic surface **back to the focus point**. It should go without saying that if you locate a secondary smaller antenna at the focus point (where the reflector energy is concentrated by the curved surface) the energy intercepted by the large curved screen reflector will be picked up by the smaller antenna.

There are several basic engineering principals at work here, and each must be respected for its limitations or the antenna will not function with full potential. For example:



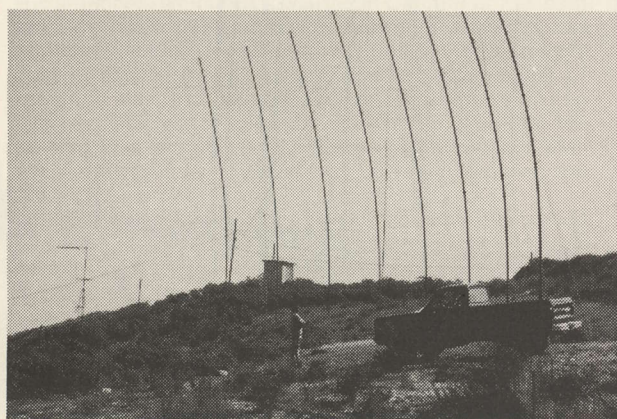
SIDE VIEW of 120 foot wide, 60 foot high Ensenada Half-Bolic.



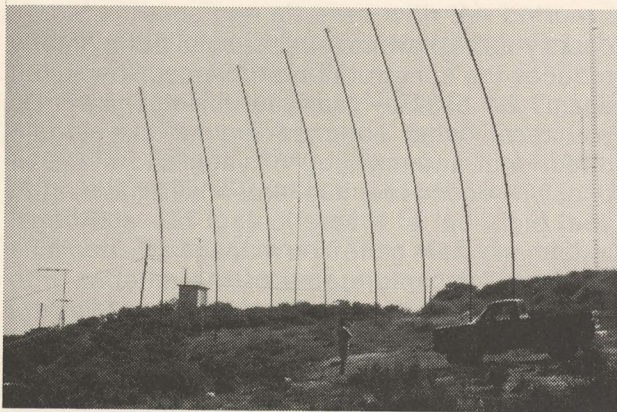
- 1) If all of the signal intercepted by the curved screen reflector is to arrive at the focal antenna 'in phase' the **physical distance from the curved screen reflector to the focal antenna must be equidistant** across the full surface of the curved reflector. In other words, signal bouncing off of the reflector surface (any point on it) must travel the same distances to the focal antenna to insure that all of the signal arriving at the focal point antenna 'adds' to the total (or, 'in phase').
- 2) Just as the distance from the reflector surface to the focal antenna must be equidistant at all points along the reflector surface, **the curve in the reflector surface must be of the proper proportions** to insure that the energy striking the reflector surface is focused **on a single point** out in front of the antenna.
- 3) The reflector surface will, under no circumstances, be 100% efficient. That is, even with solid reflector surface construction (as one finds with TVRO full parabolics) there is something less than 100% energy transfer from the reflector surface

to the focal point antenna. The percentage of efficiency is determined by (a) the parabolic 'curve' or shape, (b) the 'finite-ness' of the reflective surface (i.e. how much of the 'surface' is occupied by reflective material), and, (c) the accuracy of the construction methods (i.e. how closely the real antenna follows the ideal antenna as designed on paper). A TVRO parabolic reflector designed for **maximum gain** will have between 62 and 63% 'efficiency' while a TVRO reflector designed to meet the FCC's antenna sidelobe requirements for TVRO service will have a maximum efficiency of 55-56%. The half-bolic reflector described here will have a maximum efficiency of perhaps 50 percent.

- 4) The **focal point antenna** presents several difficult engineering problems. In a nutshell, it is an antenna with directional characteristics. It is located at a pre-determined point 'in front of' the reflective surface which means it sits **between** the reflector **and** the signal source. It would not do for it to receive energy from **both** the transmitter directly **and** the reflective surface (although the reflective surface energy will be as much as 28 dB stronger) simply because to do so would create visible ghosting of the signal. Therefore a reflector (as in a two-element yagi antenna with a dipole or driven element **plus** a longer-than-dipole reflector element) is placed **behind** the dipole (i.e. towards the transmitter source) to shut off or block out direct path energy. The sharpness or directivity of the focal point antenna must be such that the small antenna 'sees' as much of the reflector surface as possible within its 'main' directional lobe. If, for example, a multiple element yagi or log with a **narrow** front beamwidth was



OVERVIEW OF TIJUANA Half-Bolic shows hillside site, feed antenna far left.



OVERVIEW of TIJUANA SITE shows feed antenna to left, eight parabolic support masts and on far right communications tower (a hazard of being on a hilltop even in Mexico!).

utilized for the focal point antenna, the 'pattern' of the focal point antenna would **cut-off** that reflector surface energy arriving at the focal point antenna from the two extremes (i.e. **edges**) of the reflector. This simply means the gain of 'the system' would be lowered by the amount of signal 'lost' to the focal point antenna's sharp directional characteristics.

Reviewing these four major points then, the accuracy of the curved reflector screen must be high (point one), the parabolic curve must be of a design that focuses as much energy as possible to a common point (second point), the efficiency of the antenna system will be determined by the quality/quantity of the reflector surface (point three), and, the focal point antenna must be designed so that it 'sees' or is 'illuminated by' **all** of the reflector surface.

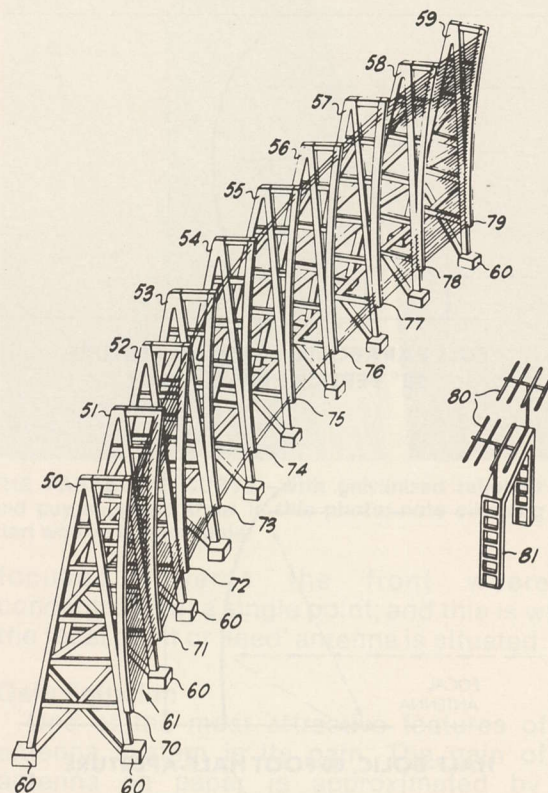
And all of this must be done for minimum capital investment while still maintaining a degree of mechanical strength that will insure a long (if not lifetime) period of satisfactory performance from the antenna.

Many for One

The antenna system to be described will cost between \$1,500 and \$3,000 depending upon your own abilities to locate the materials and the cost you attach to the labor factor. Antennas similar to this have been constructed commercially by Canadian companies for many years in the \$16-\$40,000 price range and when this type of antenna was 'popular' in the United States (during the period 1964-7) similar 'inflated' prices also prevailed when the antennas were sold on a 'turnkey' basis. The principle here is that **you can do it yourself**, with locally available materials and 'as available' manpower time. And by doing so you will arrive at the end with a 'super antenna' that does not cost super-bucks.

If that sounds like it **still** is a fair amount of money, consider these facts:

- a) The performance of the antenna system will be superior to **any** other antenna system you might install; equal to (as noted) a very-



Dew Line Parabolics—History

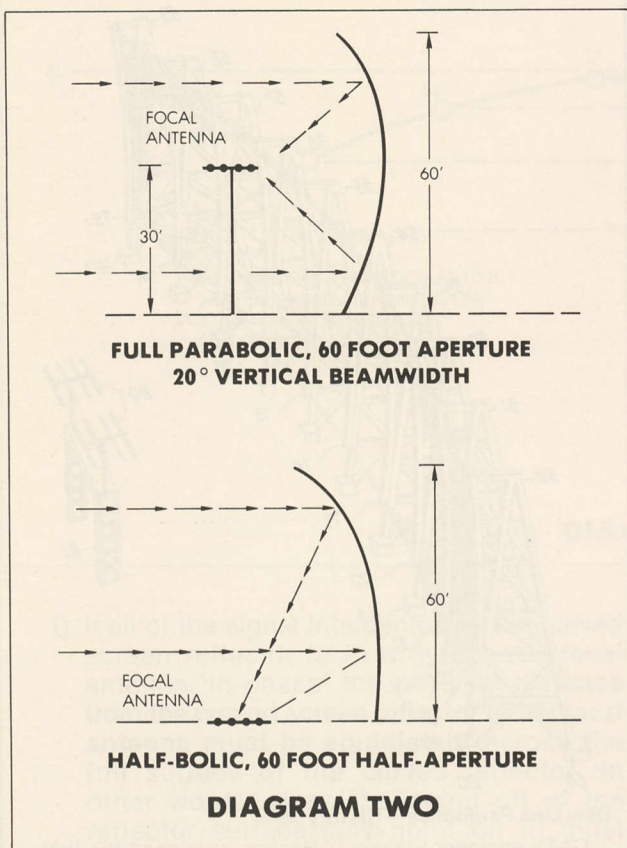
CATV engineer Stanley L. Hosken developed the first large 'tropo scatter' arrays along 'Dew-Line' (radar) design lines in the early 1960's. Hosken was granted a patent in 1966 with a number of 'claims' allowed. Hosken began with a home-brewed 30 foot rotating parabolic which he used to track satellites leaving the Florida Cape some years later (!). Hosken also developed and patented (Canadian patent 830094 issued in January of 1967) an 'exponential antenna' marrying the log to the yagi in an ingenious form. Hosken brought cable television to **North Bay** (Ontario), his hometown, by installing a 200 foot by 120 foot 'partial-bolic'. With the antenna North Bay received via Hosken's cable 8 channels including Buffalo's channels 2 and 4 at 300 miles.

Today Hosken is deeply involved in constructing parabolic reflectors for potential solar heating systems in **Pickering, Ontario**. Hosken's aptitudes have created a solar water heating system capable of boiling 65,000 gallons of water during a 19 day period; the solar reflector tracks the sun and even operates (at reduced efficiency) when the sky is overcast. And he's still in the cable business at **Bay Ridges Cable** in Pickering (east of Toronto).

So the 'roots' of parabolic antennas for CATV go way back to northern Ontario and the 1950's; and Stan Hosken is the man who started it all.

very large stacked array of 128 phased 12 dB gain logs or yagis. Because of the cost of procuring and mounting that many 12 dB 'discrete' antennas there is simply no basis for comparison here.

- b) The antenna will perform on **all channels** coming from the **same** approximate direction. That is, if you happened to be 'looking at' channels 2,4,5,7,9,11 and 13 (we'll ignore the UHF channels here) the cost of the antenna will be spread over 7 (VHF) channels. The total cost per channel then becomes a simple division problem; the



dollars spent divided by the channels in use.

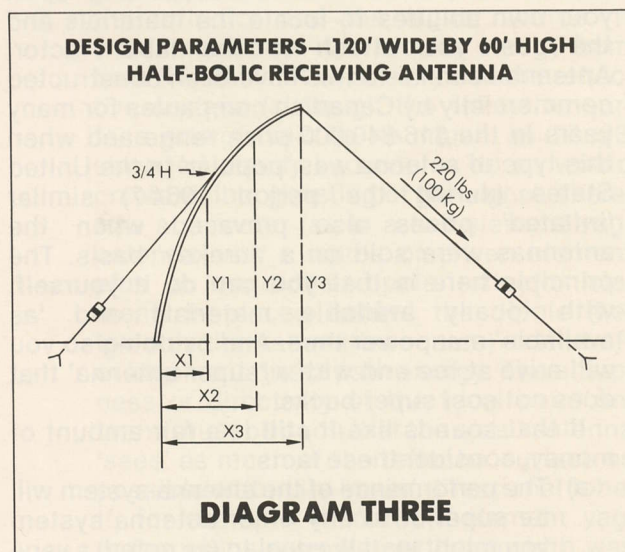
- c) The normally high cost of a suitable steel tower is eliminated. When 300 foot star guyed towers with 30-36 inch faces cost upwards of \$12,500 installed (and many are much higher than this) the savings in 'tower bucks' is considerable indeed.

You might ask 'if this antenna design is so good and if it can be built for a comparatively low dollar investment. . . why is the industry still putting up 300 or 500 foot 'sticks' and hanging logs and yagis'? It is a fair question.

First of all, many of the antennas built in the United States in the 1963-7 era of a similar design were constructed improperly. They did not adhere to the four basic engineering points previously listed. The 'half-bolic' is not a 'fussy antenna' in terms of its construction, and the tolerances required during construction during construction for proper 'text-book' performance are not beyond the ability of most to do. However, the antenna system is not forgiving of 'gross errors' and when reflector surface errors of several inches are 'built in' the performance deteriorates rapidly. So in fact many of the antennas of this type simply were improperly designed and/or constructed. They did not work to expectations and they were therefore discarded (often with a bad name).

Second of all, the antenna is only **half** of a true parabolic. That is, unlike the circular parabolic for TVRO work the 'half-bolic' is approximately full width but only **50%** (or half) height. This

costs you 3 dB over a full parabolic but it greatly reduces the construction problems. How's that again? Go back to your yagi or log theory. Do you recall what happens if you take a gain directional antenna (log or yagi) and stack or phase a second identical antenna? That's right, you pick up a theoretical 3 dB **additional antenna system gain**. You manage this because the 'size' or capture area of the antenna with two discrete antennas is now 2X the size of a single antenna. Remember the old rule of thumb. . . **'double the antenna size and pick up 3 dB'**? That's what happens in reverse when you 'half' the full parabolic. And as far as reducing the construction difficulties, well, that should be obvious. However, with the reduced size comes a trade off. The antenna 'thinks' it is full size, and it has a 'mirror ground image' laying out in front and under it. The influence of the 'invisible mirror image' second half can be considerable and here is where people installing these antennas often get themselves into difficulties. In a nutshell, the ground directly in front of the antenna (i.e. towards the focal point antenna) will **ideally** slope away rather rapidly. In other words, the best location for such an antenna (to realize its full potential gain as half of a parabolic) is where the ground drops away quickly **towards** the transmitter source(s). Were it not for the obvious physical problem of setting a focal point antenna out there some distance in front **the best** physical terrain would be on the edge of a sharp bluff or cliff. Remember the **bottom** of a 'half-bolic' is in truth the **middle** of a **full** parabolic. And the focal point antenna will sit out in front of the reflector surface **exactly even with** the bottom of the half-bolic (or the equivalent middle of a full parabolic). Now, **if the ground is level** (completely level) this places the focal point antenna **right on the ground**, literally. Obviously this is no place for a focal point antenna. So either you **raise** the focal antenna above ground, or, you **slope** the ground away so the



focal antenna can sit even with the bottom of the half-bolic (middle of a full parabolic) and **still be** above ground.

How high above ground? That's part of the problem. Two wavelengths is the minimum practical height above ground. At channel 2 that is roughly 207 inches (16 feet 3 inches) and at channel 13 that is roughly 51 inches (4 feet 3 inches). That says the ground from the base of the antenna's reflector surface out to the point where the focal point antenna will mount must fall off or away by some number equal (as a minimum) to the free-space equivalent of two wavelengths at the lowest channel to be utilized.

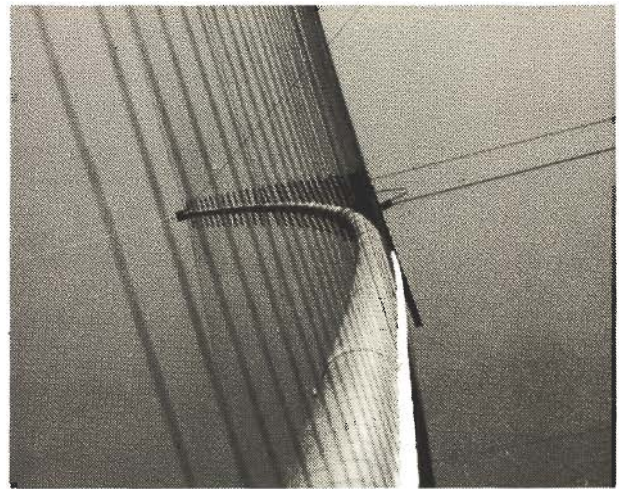
Or, you have two other choices. You could **raise** the bottom of the reflector surface up sufficiently so that it clears the ground (at the equivalent height of two wavelengths on the lowest channel in use), or, you could simply **accept lower gain** for the antenna system. This is to be a no-compromise antenna system however (other than willingly giving away the 3 dB loss that comes from halving the full parabolic), and for this reason a local solution to the local problem presented by your own terrain is advised. By the way, simply moving the bottom of the reflector array an additional 16 feet 3 inches higher (as in the case of channel 2) is not as simple as it sounds; that means the full height of the reflector array must increase by that amount, which may be taxing on the construction technique to be detailed here.

Construction Technique

The principle of construction is quite straight forward. A tall 'mast' is constructed from metal pipe and the base of the mast is secured at the ground in a support tube that is anchored in the ground in a concrete pier. The 'mast' being metal is strong but having only one support point it will not want to stand up by itself. So you guy it to keep it from falling over. Only, when you guy it, you place the guy tension on the mast in such a way that **rather than** standing up there straight, **it bends**. See diagram 3. The mast is 'hunched over' so that the **top** is out **in front of** the base, towards the transmitter signal source. This results in a curved or arced configuration which comes very close to being a straight-line segment out of a parabolic curve; or at least 'half' of a parabolic curve.

The mast pipe is carefully selected for 'stout' and the guying of the mast is done with great care; to insure that the arc maintains the parabolic curve required. If several of these arced-masts are located along a properly enscribed line on the ground, they form the support basis for the reflector surface material. More about that shortly. Then to form a reflector surface a metallic material is pulled tight or taunt between the masts forming a 'grid' of reflective surface.

Energy striking the curved surface of the reflector grid 'bounces' from the surface and is



THE PARABOLIC CURVE—with galvanized reflector wires and guy supports show in this photo; note climbing steps start well up support pole.

focused towards the front where it concentrates at a single point; and this is where the focal point or 'feed' antenna is situated.

Gain Equation

One of the most attractive features of the antenna system is its gain. The gain of the antenna on paper is approximated by the following formula:

$$A) G = 4\pi \frac{A_p}{\lambda^2}$$

Where:

G = the gain of the antenna compared to an isotropic source

A_p = the width of the surface aperture

λ = the wavelength on the channel being computed

The equation is approximate in that the gain is also influenced by the relationship between the focal distance of the antenna (F) and the diameter or aperture of the reflector surface (d). The total gain is also dependent upon the design of the focal or feed antenna (a K factor). Applying this equation to television channel 13, we have:

$$B) G = 10 \log \left(4 \times \pi \frac{6 \times 120}{4.622} \right) = 36.27 \text{ dB}$$

The formula applies to a **full sized parabolic** antenna; and ours is a 'half-bolic'. Therefore the 36.27 dB must be **reduced by 3 dB**, resulting in a forward gain referenced to an isotropic source antenna of 33.27 dB. Then because an **isotropic** source is **not** a real antenna, and a **dipole** is, we further adjust the gain 'answer' by the correction factor; and that results in lowering the paper **gain of the array** at television channel 13 to **31dB** (reference a dipole). This is the **maximum** gain you can realize with the antenna to be described; in the real world construction tolerances and errors will reduce this paper gain by perhaps 1 to 3 dB.



LOW BAND LA at 174 miles, off of Ensenada Half-Bolic.

Pattern Equation

The 'half-bolic' offers extreme reductions in co-channel interference because of two factors. Number one, its low-to-the-ground profile greatly reduces signal pick up from distant on-channel signal sources not in line with the narrow frontal beamwidth of the array. And number two, the dependence of the focal antenna on reflected energy **from** the reflector surface 'skews' or 'swings' signals arriving at the reflector surface from non-desired directions **either side** of the focal point antenna. They are intercepted by the reflector, to be sure, but because they arrive at the reflector surface at some approach angle other than dead-on they are reflected to a focal point of their own that is some distance **left or right** of the the focal point for signals arriving along the beam heading. This means that they simply do not 'focus' at the feed antenna location.

The lobe of radiation at the 3 dB points (half power) is given by the formula:

$$C) BW = K \frac{\lambda}{D\lambda}$$

where K in this formula varies from 50 to 70, $D\lambda$ is equal to the diameter of the aperture in wavelengths at the channel you are computing.

For example, for channel 13:

BW = 3° for the horizontal lobe

BW = 11° for the vertical lobe.

And for channel 2:

BW = 10° for the horizontal lobe

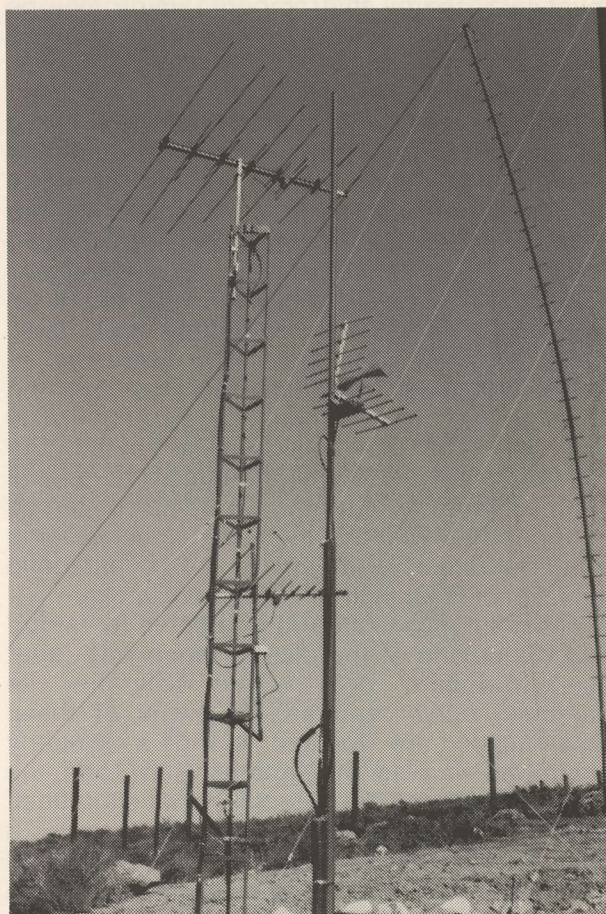
BW = 40° for the vertical lobe.

If the guy-tension wires for the reflector support masts are precisely located as shown in the material to follow the disturbance of the antenna radiation lobe structure by the guy wires will be minimal. This is because the angle that the guy wire forms with the axis of the parabola is small, and for this inclination a parabolic antenna has extremely minor secondary (non-desired) lobes. As a practical matter, non-desired signals falling outside the

beamwidth of the antenna are down by 45 dB or more.

Off-Path Signals

While the front beamwidth of the antenna is tight or sharp, it is possible to utilize the reflector surface for **desired** signals that are located **as much as 30 degrees** off of the great circle (i.e. direct heading route) of the antenna. When signals arrive on the reflector surface from a 'skewed' or off-center heading, they reflect from the surface towards one or the other side of the exact center focus point (which is where you have the primary focal antenna located). The gain does reduce of course as you move further and further off the main heading but even a 3 dB gain reduction for a signal 30 degrees off of the main heading still makes the antenna very worthwhile. When you are dealing with signals that arrive at the reflector from an 'off-center' angle, their 'focal point' will be displaced away from the primary (center) focal point to the opposite side of their arrival angle. A signal that **arrives** to the reflector **from the right** of center (as you stand behind the reflector and look through it at the center focal point) will be **focused to the left** of the normal focal point; and that is where you would locate the focal point antenna for the 'skewed' arriving signal.



SIDEVIEW OF VHF (far stand) with UHF (near pole) feed antennas at Ensenada.

Focal Point Feed Antenna

Maximum gain of the antenna system occurs when the focal point or feed antenna 'sees' the entire reflector surface within the 3 dB (or half power) beamwidth of the antenna chosen for use at feed point. The 120 by 60 foot half-bolic reflector surface and the design chosen here utilizes a focal length to diameter ratio of 0.5. Or to put it another way, the focus point of the array is 50% of the aperture. Since the width (aperture) is 120 feet, the focal point will be located **60 feet in front** of the reflector base. A dipole antenna standing alone at the focal point is attractive because it meets the 3 dB beamwidth criteria in the horizontal (side to side) plane. And adding a reflector to the dipole feed antenna (to improve the front to back of the feed antenna and improve the matching possibilities to the downline—see **CATJ** for **June 1975**) does not destroy this objective. **However**, the dipole has a vertical beamwidth considerably higher (or taller) than the 3 dB criteria. To sharpen the vertical plane there are two possibilities:

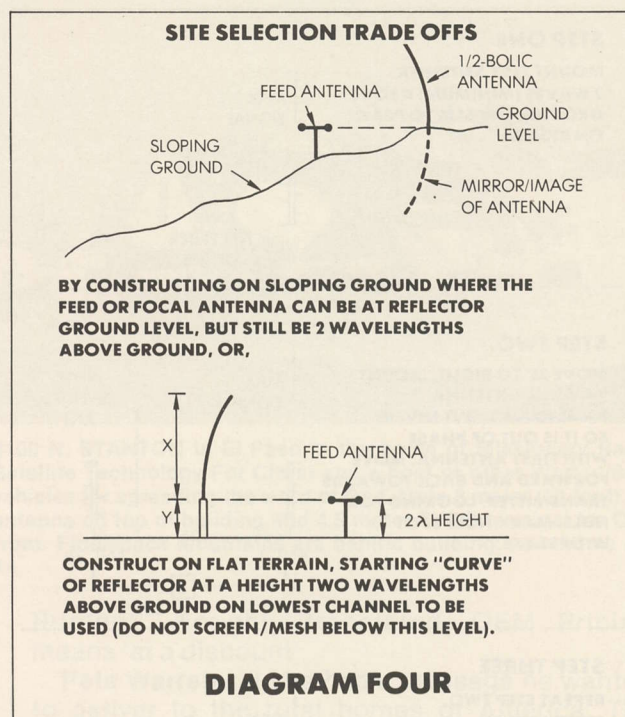
- 1) Stack two identical arrays of dipole + reflector vertically (one above the other), thereby compressing the vertical lobe, or,
- 2) Placing a director in front of the dipole (making a three element antenna).

Unfortunately when you place a director in front of the dipole/reflector, you also narrow the horizontal plane of the antenna; perhaps to the point where the edges or extremes of the reflector surface no longer fall within the 3 dB beamwidth of the feed antenna. And, if you follow standard yagi antenna design practices for the feed, the combination of the director and reflector parasitic (tuned) elements plus the resonant characteristics of the dipole results in a feed antenna that is at best **optimum only on a single channel**. This sort of nips the broadband features of the reflector surface in the bud.

There are then two other alternatives. One, simply give up the gain that would be realized if the vertical lobe **was** compressed (perhaps a dB to 2 dB), or utilize a log antenna that is broadbanded to cover the spectrum of interest. The log, **if it is too large**, will have its own horizontal lobe compression problems so in practice you usually select a feed antenna that favors the weakest of the channels of interest focusing at the center focal point. This becomes the type of 'compromise' the installer makes in the real world, contributing to the degradation of the antenna's **theoretical** 31 dB gain over a dipole.

Selecting A Location

Based upon the prior data, it would seem advisable to select a site for the antenna which is atop a hill, mountain or at least a 'rise'; so that the antenna looks 'downhill' towards the direction of the transmitters. If this is

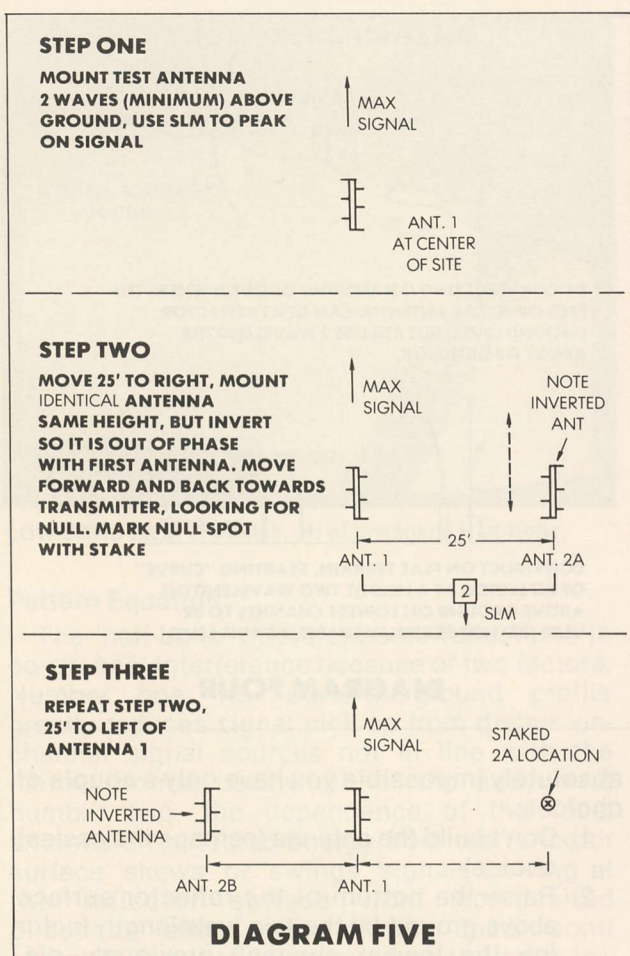


absolutely impossible you have only a couple of choices:

- 1) Don't build the antenna (perhaps the easiest choice)
- 2) Raise the bottom of the reflector surface **above** ground by the two wavelength factor (on the lowest channel) previously discussed.
- 3) Accept lower gain from the antenna system (gain will be more markedly reduced on the lower channels if the feed antenna is too close to the ground)
- 4) Take some earth moving equipment and 'grade' the site to create your own artificial fall-off area in front of the antenna (**being careful not to raise** the grade level anyplace **in front** of the antenna with the earth moved around)
- 5) Or, take some earth moving equipment and 'build' a rise for the base of the antenna.

With the location selected (following the usual good headend location selection processes of avoiding looking at or through power lines, busy highways, etc.) the next step is to determine the base line for the antenna. **The base line** is your standard reference line on or against which all support masts are measured for final location.

The concept is straight forward but perhaps seldom practiced. The **absolute** direction towards the desired transmitter must be selected. Then a line perpendicular (i.e. at right angles) to the transmitter heading line is drawn or staked across your head end site chosen. This perpendicular-to-signal-path line is your base line. The concrete piers for the support masts will be fixed in specific locations using the base line as the primary reference. This



must be done with considerable care to insure that when you are done the eight metal masts are located in the right locations so the constructed half-bolic is dead-on the heading with the transmitter(s).

The method to be described will locate the base line for you with great accuracy. Remember the base line is **perpendicular** to the signal heading which is another way of saying that **any point along the base line is the exact same distance from the transmitter as any other point along the base line.**

Start in the middle of your site choosing a spot where you would like to be able to locate the **center** of the reflector. Erect a test antenna of adequate gain here to pick up the desired signal, **at least two wavelengths** (in free space)

above ground. Orient the antenna for maximum signal.

Now install an identical antenna (**same brand and model**) approximately 25 feet to the right of the first test antenna; but **invert** the antenna (i.e. **turn the log or yagi over so it faces the opposite side to the ground as the first antenna**). Now combine the two antennas (with equal lengths of RG-59/U) through a hybrid coupler and observe the signal level from the two-stack array on a field strength meter or spectrum analyzer. With the **first test antenna left alone**, and the second test antenna oriented for maximum signal carefully and slowly **move the second test antenna forward (and back)** maintaining the antenna heading **until** the signal level **drops into a null** (weak point). The null should be sharp and pronounced. **Mark the location where the null is found with a stake.**

Disconnect the right hand antenna and move it the **same distance to the left of the first antenna**, repeating the process done on the right. Move it forward and backward **looking for a null** (still with the second antenna phase-inverted by being upside down). Again **mark the location of the null with a stake.**

The three points should line up in a straight line; i.e. stake, center original test antenna, and stake. **This line is your base line.**

Now extend that base line in **both** directions along a straight path until you have a base line (marked with stakes) 120 feet long and centered at the first test antenna. Return to the center (original) test antenna and if your base line extends (as it should) 60 feet **either side** of the original test antenna, you may now form a 90 degree (**right angle**) perpendicular to the base line and go forward (**towards the transmitting station**) 60 feet. **This will be your focal point antenna location.**

Normally the terrain where the antenna will be installed is anything but level, and to maintain an accurate base line and focal point location technique it will be necessary as you trace the lines to use a surveyor's transit, stakes and (heavy) bricklayer's string to properly locate the points of interest.

Next month we will proceed with the collection of materials and begin construction on the 'Half-bolic' antenna system.

Coming From The Right Direction

SPREADING GOD'S WORD VIA SATELLITE

Christ Looks Down From On High

As you move through El Paso from the eastern side of the city your eye notices a mountain range that slices down from the north seemingly headed straight into the Rio Grande river that

separates the U.S. from Mexico. The ridge does slice the city in two, but it stops just short of the Rio Grande and through the gap at the Rio Grande the Texas residents have created freeways and wall to wall business districts that

display their industrious nature. The Franklin Mountains, as the ridge is known, is the home for all of El Paso's commercial television stations. From atop the ridge the TV towers command a magnificent view that sends their signals west to the Arizona border, north far into New Mexico and east across the plains of largely uninhabited Texas.

Just across the river on the Mexican side a poor cousin of the Franklin ridge rises majestically and barren above the metal roofed and often open sided Mexican homes cloistered at its base. And where the top of the Franklin ridge in El Paso is cluttered with clusters of TV and radio and communication towers, and homes or apartments every year creep slowly higher and higher up the barren sides, the lone Mexican cousin to the Franklin ridge boasts but a single, unimproved, winding switchback road that slowly leads to the top. A large, perhaps even huge, **cross** marks the top of the Mexican side peak. The cross can be seen from virtually any point in El Paso and its message permeates down on the residents of both El Paso and her sister city Juarez. The contrast, with the American side's TV and radio towers, and the Mexican side's tribute to Christ is unmistakable.

And it all may be changing. For in El Paso, on Stanton street due north of the Mexican side's cross, is a small building that will one day soon bring religion to the top of Franklin mountain. Soon, it is said in El Paso, a message even stronger than the message of the cross will radiate from the very top of Franklin mountain, from a location even higher than the commercial TV channels on Franklin's slopes and that message will be God's message. And unlike the Mexican cross, the new Christian message coming to the top of Franklin Mountain will be 'seen' as far west as the Arizona border, as far north as the center of New Mexico and as far east as the great unpopulated plains of West Texas. And with a little help from CATV, it will go further still.

A new television station is coming to El Paso. And it is being brought to the west Texas city by the same wonderful people who brought low cost CATV earth terminal pricing to the cable industry during 1977.

The New channel 14 television station is being constructed by **Missionary Radio Evangelism, Inc.**; the same group of people who through **Satellite Technology for Christ (STC)** have been plying the cable shows and cable offices through out the southwest this past six months offering to assist cable operators to install small aperture TVRO terminals for around \$12,000 in hardware cost.

As far as the cable industry was concerned, it all came out into the open during the July (1977) CATA CCOS meeting. A quiet man by the name of Pete Warren appeared amongst the throng in Oklahoma and offered to assist cable operators in acquiring their TVRO hardware (LNA, antenna and receivers) for something called "OEM



3100 N. STANTON in El Paso is the home of Missionary Radio Evangelism, Satellite Technology For Christ and a host of other Warren/Blomerth created vehicles for spreading the word of God. Note 3 meter (10 foot) ATS-6 (860 MHz) antenna on top of building and 4.5 meter TVRO terminal for CBN reception in front. Fiddleback Mountains are behind building; new home of their channel 14.

Pricing". Roughly translated, OEM Pricing means 'at a discount'.

Pete Warren said he had a message he wanted to deliver to the rural homes of America. The message of Christ. **"If you will agree to carry one of the satellite delivered Christian programming channels** (i.e. either CBN or PTL), **we will assist you in finding low prices on the hardware you need"** said Warren. When his 'cost-pricing' for the LNA, the 4.5 meter dish (with mount and feed) and the single channel receiver were all added up, it came to a tad shy of \$12,000. **"You will do your own installation"** suggested Warren, **"or, we'll provide you with that also for a modest fee per engineering day involved"**.

Word spread fast. Not only at CCOS, but elsewhere. By the middle of September more than 125 CATV system owners and operators had requested the formal written presentation from STC and by the first of November approximately a dozen CATV systems had agreed to buy their hardware through STC. There was a hitch of course.

"We are asking CATV systems to agree to a contract wherein in return for our helping them acquire the hardware at these discount prices they agree to carry one of the Christian TVRO satellite channels". That seemed like a fair trade to many system operators. But for how long? **"Our contract suggests twenty years"** notes Warren, **"But we'll listen to reason"**.

Many systems balked at agreeing to carry CBN (or anything else) for twenty years down the road. "My franchise is only good for ten years" noted one operator. "I'd be a fool to agree to carry something that extended beyond my contract expiration date with my town". Another operator had another view. "I like the twenty years. I've been looking for a reason to get the city to re-open my franchise and to extend it for a period longer than the present 15 year term. I think I can convince them why I need a twenty year re-newal now, and for that I am willing to take a chance

that CBN will be around that long in a format that is useful to me."

If CBN is not around that long, of course, the whole question is moot anyhow. But regardless of how the individual systems turn and point when all is said and done, the impact that STC has had on the 1977 growth of small aperture earth terminals has been considerable. . .to say the least.

"I ended up buying a \$27,000 terminal with three receivers, but not through STC" reports one operator. "I had been dragging my feet for several months trying to decide whether I would move now or in a year or two for a terminal. The \$12,000 price tag made up my mind for me. I was going to get a terminal, now. After I really got into it I decided I didn't want to be tied to anyone for twenty years or even ten years. But because I made up my mind to go ahead now, I was then ready to go out and buy a turnkey the way I wanted it. Those guys at STC got me to commit to a decision, and for that I'm grateful". **This operator was not unique.** Most who contacted STC did not buy through STC (although some did and many more will before it is all over); but virtually all agree that the STC 'proposal' built a fire under them and speeded up their eventual decision for a terminal.

Make no bones about the impact of STC this past summer and fall; it was (and still is) considerable. Some of the suppliers who did not opt to offer discounts on their goods for STC resale had more than a few anxious moments. One quipped "This is a tough enough business without having God working for the competition". Another noted "That is one very interesting marketing program". And then he added "I kind of wish I'd thought of that one!"

A trip to the STC or Missionary Radio Evangelism headquarters on Stanton street in El Paso is a most inspiring one. Even those without 'the faith' are bound to come away just a little bit impressed with all that they have accomplished in the relatively short span of four years. From zero assets and not a dime between them in the fall of 1973, Alex Blomerth and Pete Warren are now riding herd on assets probably valued above a million dollars. And the debt to asset ratio is most impressive; roughly 1 part debt to 10 parts assets.

Missionary Radio Evangelism (MRE) began when a cracker jack engineer named Pete Warren met up with a tired research physicist named Alex Blomerth. Warren had kicked around the world and electronics since he was a small lad. A ham radio operator at a tender age, he rose to the position of Vice President of Sentry Manufacturing Company in Chickasha, Oklahoma; an international supplier of electronic standards including quartz crystals. Betwixt and between his love for electronics and a self admitted abundance of wanderlust he found God. Perhaps it was during his five year stint of living off the land in Kashmir (in extreme northern India). . . Pete is not sure. . .but when he found God he just

'knew' that his talent with electronics must be dedicated, along with the balance of his life, to God's work.

Blomerth's life style in no way paralleled Warren's, until they met. A research physicist at White Sands until his 46th year, Blomerth had traveled the world and he too found God, and Warren; not necessarily in that order. Together they discovered that there was a need and a market for radio tapes for radio stations; tapes that spread the word of God. And so operating out of a garage in El Paso the two joined forces to create and duplicate and distribute radio evangelism programming for radio stations throughout the world.

And then began a series of events that can only be described as 'uncanny' if you are not a firm believer; or miraculous if you are a believer. Warren tells it. **"The El Paso TelePrompter system suddenly found itself with no source for film programming for its local origination channel. Only we didn't know that. One day Alex and I woke up and both spoke of having had a vision during the night. The vision was identical. . . we were to go down to the cable TV office and ask if we could provide some religious television programming for the local origination channel. We had no television equipment and Alex had never even been in a TV studio. Neither of us had ever produced as much as a station break, but with Bibles under our arm we headed for the cable office."**

And so the first 'miracle' evolved. Just moments before the pair walked into the manager's office the system had been advised by New York that suddenly, without notice, there would be no more films for local origination. The manager clearly was faced with a problem; what to do with a local origination channel.

"One program!" asked the manager incredulously "How about several? How about filling the channel up full time?"

And so Blomerth and Warren were in business. They had an outlet, now they had to tackle the 'small' problem of filling the airtime. Blomerth picks it up.

"We stewed about the dilemma for a day or two, and then we get together enough equipment to begin to do a couple of hours per day. But the day was rapidly approaching when we either had to program the full channel full time or forfeit our right to it. And then the second miracle happened."

One day both Blomerth and Warren awoke and shared their thoughts. **"I believe we should go to San Diego and look into some used TV production equipment there"** suggested Blomerth. Warren allowed as how he too thought that was a good idea, yet both claim they had only the vaguest of contacts in San Diego and that was through a 'used broadcast equipment broker' who to date has been something less than accommodating in finding them the gear they wanted at the price they were able to pay.

"We arrived in San Diego without a spare dime between us" recalls Blomerth. **"We were met at the airport by the equipment broker who said he had arranged hotel accommodations for us, on him, and he had a car for us to use. We explained that we had no money; not even a dime"** remembers Warren. The two recall that the broker only smiled and said **"That's alright, when you need it, you'll find it"**.

One of the stops for the pair was a well known broadcaster type who reportedly had a couple of used color cameras stowed away. They looked at the cameras and then met with the owner. **"We have no money"** explained Blomerth **"but I like your cameras"** added Warren. In discussing the cameras the owner said he had taken them out of a fully equipped color van; the kind you see the networks utilizing at pro-football games or at the Rose Bowl. Warren still doesn't remember what inspired him to ask the next question. **"Would you sell the whole van, complete?"**. Blomerth recalls that the possibility—however remote—of having their only fully equipped production van, with a four camera chain was so grand that for a minute he too forgot that they had no money.

Well, the van was for sale and the price was \$200,000. **"We told the owner again that we had no money, and he replied 'my boy, I believe in God's work and I believe that you can find the money. Go back to El Paso and look'."** And so they did.

Their first thought was to hold a telethon over their newly activated cable TV channel in El Paso. After a short planning period the telethon was put on the air and they raised \$17,500. **"That was alot of money, but it was far from \$200,000"** remembers Blomerth.

And along came the next miracle. One of the viewers of the telethon was a man of considerable means in El Paso. He offered to arrange **financing** for the balance of the project, not to exceed a total cost of \$175,000. The offeree said he figured that they'd raised 10% of what they needed and that they should go back to San Diego with that message.

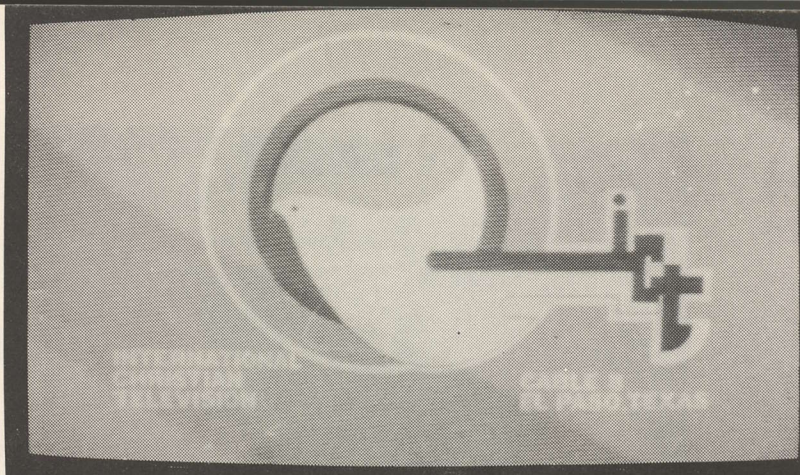
And so Warren and Blomerth headed back to San Diego, assured only that they could write a good check for \$17,500 and offer financing for another \$157,500; a total of \$175,000.

"The price on the van is \$200,000" said the owner. **"You are shy \$25,000."**

Blomerth recalls that the owner was firm on the price but Warren made an alternate suggestion. **"Can we sit down and go through the van, item for item, assigning a value to every item in the van?"**. Warren felt that perhaps they could single out some equipment that could be passed over, reducing the cost of the package.

Warren remembers **"Two of us sat down and we went over the fair market price of everything in the van; everything. There were probably over 100 items, and we agreed on a price for each. Then when the last item was reached we went back and totaled up everything."**

You've probably figured out by now what happened. The item by item pricing on the full



MRE/CBN EL PASO as it appears on the 30,000 cable homes in El Paso. Channel reports an average of 11,000 homes tuning in channel during typical week.

mobile production van came to \$20 over the \$175,000 price tag. And so MRE was in business with a production center.

And so MRE has created a unique cable-service channel. On channel 8 for the El Paso system MRE provides twenty four hours per day of programming. Much of it is built around the use of SATCOM II transponder 8, or the CBN service from Virginia. Yes, MRE has their own earth terminal.

In fact, the 4.5 meter Prodelin terminal installed by MRE for reception of CBN was their 'entree' into the CATV earth terminal business. With CBN 'on the bird' MRE knew that by having access to the CBN programs they could build around the CBN programming schedule with their own locally produced programs. The experience and knowledge they gained installing their own terminal was the catalyst that got them interested in helping other cable systems gain access to CBN.

However, MRE's satellite experience predated the CBN channel. 'Old-timers' will recall that several years ago (1974 to be exact) the United States Government launched an Applied Technology Satellite (ATS-6) which provided a one year test of instructional type programming in the 2.5 GHz range throughout the Rocky Mountain States. Well, when the ATS-6 experiments over the Rockies was over the U.S. Government moved the satellite to a position over the equator due south of India and there it provided experimental television to India. Then when the Indian experiments were completed the ATS-6 was returned to the United States, and is now parked approximately south of Hawaii and in geo-stationary orbit. The present dedication of ATS-6 is to experimentation. One of the experiments utilizes an 860 MHz (that's 0.860 GHz) transponder which has a 'beam steerable' footprint that can be directed into the Central America/Caribbean region. Now CBN has made arrangements with the U.S. Government to utilize the 860 MHz transponder an average of 90 minutes per day for the satellite relay of Christian television programming into the area south of the United States.

But to receive these FM 860 MHz broadcasts from ATS-6 someone had to design and build a (low cost) satellite type receiver. Pete Warren of



PETE WARREN and his 860 MHz receiver for the ATS-6 system.

MRE was that someone, with some help from a few others (including NASA that did some paper design work on a receiver for this transponder). So with this project the El Paso based MRE had yet another job to be done; to put into service approximately 100 of the 860 MHz downlink FM receivers. Warren tackled the job like so many others he has tackled to date; he simply sat down and did it. Using a Prodelin ten foot dish, with a special feed for 860 MHz, Warren designed a 'tin-can-receiver' that places four electronic module boards around a central 'wiring channel'. A separate RF head with a low noise, high gain RF stage mounts at the antenna proper. The receiver looks pretty much like any other TVRO type receiver after the RF head and down converter from 860 MHz (input) to the 70 MHz IF. Only it comes out of El Paso and it is intended for low cost reproduction for use in the Caribbean for reception of CBN broadcasting via ATS-6.

High above their Stanton Street location stands the fiddleback ridge known as the Franklin Mountains. The ridge climbs higher and higher as it moves to the north; the three El Paso commercial television stations range from 4,900 to 6,000 feet above sea level (El Paso itself is 3,700 feet MSL). But none of the commercial stations are at the **top** of the Franklins; the further north one goes along the ridge the more inaccessible the terrain.

The tallest tower on the ridge belonged to a two-way radio service company. MRE had selected a ground site adjacent to the tallest tower and this started a battle with the two-way radio company. **"They were concerned that our channel 14 signal would tear up the front ends of their 450-470 MHz repeaters and receivers"** notes Warren with a smile. The two-way company had reason to be concerned. MRE's CP for channel



ALEX BLOMERTH-antimated, a bundle of energy always on the run.

14 and a new non-commercial religious television station was bound to have some impact on the two-way gear atop the ridge. **"We negotiated to use their tower, to no avail"** notes Warren **"So we announced plans to build a new tower that would be next to theirs"**.

The two-way company then had second thoughts and early in November MRE and the two-way company reached an accord. The new channel 14 could locate atop the tower afterall. **"They figured it would be better to have our channel 14 antenna above them than along side of them"** remarks Warren. And so the new channel 14 for west Texas is off and running. A few obstacles remain of course. Such as how do you move a 4,000 pound UHF transmitting antenna to the top of a mountain, and then to the top of a several hundred foot tower, with nothing more stout than some lightweight winches that can haul perhaps a 1,000 pounds at a time. A tramway goes to the top of the ridge, and it can carry the heavy transmitting antenna up to the top. **"But when you get a 4,000 pound antenna to the top, then what?"** asks Warren. **"How do you get it off of the tramway sling and up on the tower without heavy equipment?"**.

Clearly another miracle is needed. **"But we'll find a way"** says Blomerth, confident that before the project is over they will solve the present problem. **"When we do, the new MRE channel 14 will be located at the tallest point above sea level occupied by any Texas television station"**. That it will, beaming MRE and CBN programming over a good part of the southwest. And when this happens the tallest **peaks on both sides** of the border will be occupied for Christ's work. The 'cross' of MRE will join the sister cross on the Mexican side and El Paso will be effectively surrounded by the sight and sounds of God from above.

COPYRIGHT: THIS IS THE YEAR IT ALL BEGINS

by
Craig S. McCoy
Cole, Zylstra & Raywid
Washington, D.C. 20006

When President Ford signed Public Law 94-553 as passed by the 94th Congress, the cable television industry for the first time became subject to payment of copyright fees for carriage of television broadcast signals. (1). This paper will outline the most important requirements that must be observed by all CATV systems pursuant to Pub. L. 94-553. In addition, the method for calculation of the copyright fee will be set out, and we will attempt to answer the most common questions concerning CATV copyright liability.

I. Requirements of the Copyright Act

The most important requirements of the Copyright Act are as follows:

A. All CATV systems in existence as of April 18, 1977 were required to file a "cable television initial notice of identity and signal carriage complement." This "initial notice" was to include certain information as shown on the form attached hereto as Attachment A. (The specific format of Attachment A need not have been used, but all of the information solicited must have been filed.) Any CATV system becoming operational after April 18, 1977

(1) Of course, CATV has always been fully liable for direct use of copyrighted materials, such as origination of a copyrighted play, etc. In addition, where the cable television industry secures its own programming, such as through HBO or some other program supplier, it is paying copyright fees as part of that program purchase.

must file a similar initial notice form at least thirty days **prior to** becoming operational. Once a cable system has filed its "initial notice," it must file a "notice of change" of any changes in the information supplied within

thirty days **after** the change occurs. See Attachment B hereto for a sample "notice of change" form.

B. The next important date to remember is January 1, 1978. On January 1, 1978, actual copy-

CABLE TELEVISION INITIAL NOTICE OF IDENTITY AND SIGNAL CARRIAGE COMPLEMENT

TO: Copyright Office
Washington, D.C. 20559

This notice is submitted for filing in compliance with Section III (d) (1) of Public Law 94-553 (90 Stat. 2541) as follows:

(1) Name of Cable TV System:

Individual Proprietor ☐ Partnership ☐
Corporation ☐ Other _____
(Specify)

(2) Proper Mailing Address:

(3) Name of Community [or communities] serviced by cable TV system (including any and all incorporated and unincorporated areas identified by City, Town, Borough, Township, County, etc. as may be appropriate):

(4) List here **all** Broadcast (TV, AM & FM) signals regularly carried over the Cable TV system:

TV Broadcast Stations

Station Call Sign	City of Station
-------------------	-----------------

AM Radio Broadcast Stations

Station Call Sign	City of Station
-------------------	-----------------

FM Radio Broadcast Stations

Station Call Sign	City of Station
-------------------	-----------------

The Foregoing Notice has been Prepared by:

(Signed) _____
Print Name _____
Title: _____

Date:

Should any communication be necessary in connection with the foregoing, the original should be directed to that person specified above with copy to:

ATTACHMENT 'A'

**CABLE TELEVISION
NOTICE OF CHANGE OF IDENTITY
OR
SIGNAL CARRIAGE COMPLEMENT**

TO: Copyright Office
Washington, D.C. 20559

This notice is submitted for filing in compliance with Section III (d) (1) of Public Law 94-553 (90 Stat. 2541) as follows:

(1) Name of Cable System:

Individual Proprietor ☐ Partnership ☐
Corporation ☐ Other _____
(Specify)

(2) Proper Mailing Address:

(3) Name of Community [or Communities] Served by Cable TV system (including any and all incorporated and unincorporated areas identified by City, Town, Borough, Township, County, etc. as may be appropriate):

(4) Statement of Nature and Date of Change and/or Nature of Correction to Previously Filed Information:

The Foregoing Notice has been Prepared by:

(Signed) _____
Print Name _____
Title: _____

Date: _____

Should any communication be necessary in connection with the foregoing, the original should be directed to that person specified above with copy to:

ATTACHMENT 'B'

right liability for carriage of broadcast signals commences. (There will be no payment for such carriage **prior to** that date.) As payments are to be made every six months, the **first pay-**

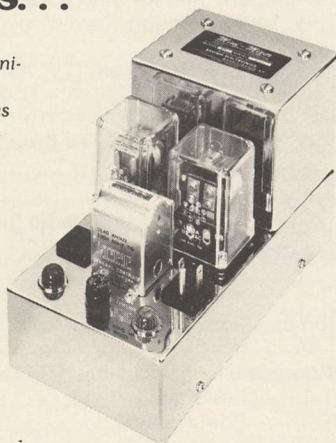
ment of copyright fees will be due on or about July 1, 1978. (The actual date for the first payment will be announced subsequently by the Register of Copyrights.)

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**T.C. Masters
TV Signal Service
Mena, Arkansas**

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1978—Year of Copyright

The seed is about to sprout. **Copyright**, largely without the support of the majority of CATV system owners, became a reality when a comprehensive rewrite of a 1909 Copyright Law was enacted during the closing days of the 1976 Congressional session.

The bill requires some form of copyright payment from all CATV systems. The bill does not totally define what is and is not a CATV system, although most MATV systems are exempt (as are translators). This is the year when the 'piper must be paid'.

How do you handle it? What must you do?

That's the meat of this paper prepared by attorney Craig S. McCoy. The author has done his homework carefully, and while you may not find all of the answers you require here, those that you do find should arm you well for coping with this new system burden in the coming year.

II. Calculation of Fee

The concept underlying Section III of Pub. L. 94-553 is that the CATV industry should pay copyright fees for its "use" of "distant" signals. Thus, the Act provides that copyright is not to be paid for carriage of "local" signals. The Act defines "local" signals as all those stations that are entitled to demand carriage on a CATV system (i.e. "Must-carry" stations) pursuant to the FCC's rules in effect on April 15, 1976. This date is not subject to change, regardless of subsequent changes in the FCC's rules that may alter the distant/local status of a television broad-

(2) Please note that with respect to Mexican and Canadian signals, while such signals do not enjoy "must-carry" status under the FCC's rules, for copyright purposes such signals are to be considered local if they would be considered local as American stations. Also with respect to Canadian and Mexican signals, their carriage by CATV systems is subject to full copyright liability if the Mexican signal is carried by any means other than off-the-air or if the Canadian signal is carried in a CATV community located more than 150 miles south of the Canadian border and also located south of the 42nd parallel of latitude. However, these limits do not apply to any Mexican or Canadian signals actually carried on a CATV system or authorized for carriage by the FCC as of April 15, 1976.

cast signal with respect to a CATV system. Accordingly, the first step in calculating the copyright fee is to determine which signals are distant within the meaning of the FCC's rules in effect on April 15, 1976 (2).

Once you have determined how many distant signals you are carrying, it is necessary to assign a Distant Signal Equivalent (DSE) value to each such signal carried on your system. One Distant Signal Equivalent is equal to full-time carriage of one independent station. (An independent station is defined as any commercial station that is not owned or operated by, or affiliated with, one or more of the television networks in the United States providing nationwide transmissions, and that transmits a substantial part of the programming supplied by such networks for a substantial part of that station's typical broadcast day). Thus, each full-time distant independent station that you carry is assigned one DSE. Each distant network signal that you carry and each distant educational or noncommercial station is assigned one-quarter of a DSE.

Once you have determined the number of DSEs carried on your system, the payment is calculated by taking the semi-annual gross revenue derived from providing television broadcast signals and multiplying it by a sliding scale of percentages based upon the number of Distant Signal Equivalents that are carried. However, the DSE formula is not used for CATV systems with less than \$160,000 semi-annual gross receipts. Instead, such systems pay fees based on a sliding scale keyed to gross revenue and without regard to the number of DSEs carried. The fee schedules, along with sample computations, are set forth in Attachment C.

III. Common Questions and Answers

Q. Are installation charges or revenue derived from pay-cable to be considered as part of the copyright fee base?

A. No. The only revenue in the copyright fee base is revenue derived from transmission of television broadcast signals. You may exclude installation charges, revenue from pay-cable, revenue from advertising, leasing of channels, and other such additional revenue sources.

Q. My system has a two-tier rate schedule whereby the second tier of service, which is optional, consists of a pay-cable channel and several channels of television broadcast signals not available on the basic or first tier service. How do I treat the revenue from the second tier service for copyright purposes?

A. The Act does not provide any specific answer to this question. We believe, however, that a reasonable allocation of the second tier fee could be made between the pay-cable service and the transmission of additional broadcast signals.

You would thus separate that portion of the second tier revenue allocable to the pay-cable service from the total second tier revenue before calculating your copyright fee.

Q. Are Canadian and Mexican signals network or independent stations?

A. In most instances, it is likely that Canadian or Mexican signals will be considered as independent stations, since it is extremely unlikely that they will carry enough U.S. network programming to qualify as network stations. However, it is possible that there may be a few Canadian signals that carry sufficient U.S. network programming to qualify as network stations. This determination would have to be made on an individual station basis.

Q. I carry two distant independent stations, but because of channel limitations I have to carry them on one composite

CATV COPYRIGHT FEES		
Calculating How Much Must Be Paid		
Payment is figured on a per system basis as shown in the following table. Note that all CATV systems pay something.		
Semi-Annual Subscriber Revenues	Semi-Annual Payment Rate	Computation
Under \$40,000	\$15	\$15
\$40,000-\$80,000	.5% of adjusted	Adjust revenue by subtracting difference between actual revenue and \$80,000 from revenue. Adjusted revenue then multiplied by .005 Example: Revenue \$50,000 $\begin{array}{r} \$80,000 \\ -50,000 \\ \hline \$30,000 \end{array} \quad \begin{array}{r} \$50,000 \\ -30,000 \\ \hline \$20,000 \end{array} \quad \begin{array}{r} \$20,000 \\ \times .005 \\ \hline \$100 \end{array}$
\$80,000-\$160,000	.5% of gross subscriber revenue up to 80,000. 1% of gross subscriber revenue between 80,000-\$160,000	Revenue-\$100,000 $\begin{array}{l} \$80,000 \times .005 = \$400 \\ \$20,000 \times .01 = \$200 \\ \hline \text{Payment} = \$600 \end{array}$
Over \$160,000	Payment based on number of distant signal equivalents. .675% of revenue for 0-1 DSE .425% of revenue for 2-4 DSE .2% of revenue for over 4 DSE	Revenue = \$500,000 DSE = 2.5 $\begin{array}{r} \$500,000 \times .00675 \times 1 = \$3,375 \\ \$500,000 \times .00425 \times 1.5 = \$3,188 \\ \hline \$6,563 \end{array}$
ATTACHMENT 'C'		

channel. Do I count these as one DSE or two DSEs?

A. Part-time carriage of distant signals is to be treated on a **pro-rata** basis. Thus, in your example since you carry only one full-time composite channel of independent programming, this would count as only one DSE. (The actual computation would be based upon the amount of carriage of each individual station. Thus, if you carry one station for three-quarters of its broadcast day and the other station for one-quarter of its broadcast day, you will still arrive at one DSE for the composite channel.)

Q. Do I pay copyright fees for signals that are brought in on a periodic basis under the Commission's substitute carriage rules?

A. Where you carry substitute programming because of mandatory deletion of otherwise available programming, such as under the syndicated exclusivity rules, you do **not pay** copyright for that **substitute** programming. There is one **exception** to the program substitution rule. Where the program substituted is a **live** program, then copyright liability does attach, and the value for the substituted live program shall be one full DSE multiplied by the number of days it is carried and divided by the number of days in the year. However, where you carry program-

ming on a permissive basis, such as "late-night" programming or "specialty" programming, then you pay for such programming on a **pro rata** basis. For example, if you carry a distant independent station pursuant to the late-night rules, and such carriage amounts to approximately one-quarter of its broadcast day, you would be assessed one-quarter of a DSE for such carriage.

Q. Are MATV systems subject to copyright liability?

A. No, as long as they carry only "local" signals as defined by the Act and do not make a direct charge for MATV service.

Q. Is there any penalty for alteration of television broadcast signals under the Copyright Act?

A. Yes. If you make any alteration in the television broadcast signal, specifically including commercial substitution, you forfeit your compulsory copyright license and are subject to full copyright liability. The only exception is that television commercial testing may be done where the test commercials are substituted for the commercials appearing on the television broadcast signals pursuant to the full agreement of the television broadcast station whose commercials are being deleted **and** the advertiser whose advertisements are being deleted. Further, such substitution may **not** be done for the

purpose of deriving income from the sale of the substituted commercials. We also note that **tape-delayed** CATV carriage of television broadcast signals is **not** permitted in the continental U.S.

Q. Are "specialty" stations considered to be independent or network?

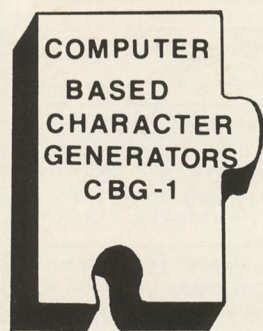
A. Unfortunately, the Act does not distinguish between traditional independent stations and "specialty" independent stations. Thus, specialty stations count as one full DSE, assuming you carry them on a full-time basis. As noted above, however, if you carry only the specialty portion of the programming of one of these stations, then your copyright fee would be on a **pro rata** basis.

Q. Are there any exemptions from copyright liability for CATV systems based on size, etc.?

A. No. There are no exceptions whatsoever. Indeed, the Copyright Act does **not** even **recognize** the FCC's **under-fifty** subscriber exemption. Thus, **all** CATV systems must pay at least the minimum fee as set forth in Attachment C hereto.

Q. What are the penalties for violation of the Act?

A. Violation of any of the provisions of the Act relating to cable systems constitutes copyright infringement. The primary penalty is loss of the compulsory license otherwise



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afforded the system. **This makes the system fully liable for copyright for all signals that it carries.** The most serious problem here is that not only would such a system be subject to suit from any one of the undoubtedly hundreds or thousands of copyright holders whose programming it will retransmit, but **the Act specifically empowers local television broadcast stations to sue such cable systems** in the name of the copyright holders. There undoubtedly are a number of television stations around the country who will use this provision against infringing CATV systems. Among the remedies that may be sought for infringement by a cable system are injunctions against further infringements, actual damages suffered by the copyright owner, and any profits of the infringer that are attributable to the infringement. Or the copyright owner may elect to recover, instead of actual damages and profits, statutory damages in the sum of not less than \$250.00 nor more than \$10,000. However, **if the copyright owner can prove that the infringement was willful**, then the court has discretion to increase the award of statutory damages to a sum of not more than \$50,000. In addition, the court is empowered to award attorney's fees if the copyright owner prevails in the suit for infringement. There are also criminal penalties for CATV copyright infringement; however, we believe it to be unlikely that the Justice Department would be interested in pursuing criminal cases against CATV operators except in the most extreme and aggravated of cases.

Q. Am I liable for copyright infringement for violations of the network or syndicated exclusivity (non-duplication) rules?

A. We think that the answer is yes since the CATV compulsory license extends to secondary transmission of only those television broadcast signals authorized for carriage by the FCC. Thus, all forms of "illegal" signal carriage would constitute copyright infringement.



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And you get this unique threshold extension from patented* circuitry with a simplicity of design that delivers the high level of reliability you've come to expect from Hughes.

Our receiver has 24 channel frequency agility for your protection and flexibility in accommodating rapid changes in your program supplier's transponder or satellite assignment.

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Earth Station Technology Seminar, January 16-18, 1978, Kansas City, Kansas

*Patent Nos. 3,611,168 - 3,346,815 - 3,346,814.

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They Have Weather In Mexico!

Just finished reading your very excellent article on Mexican CATV in the November 1977 issue of CATJ.

There is one correction which should be made to the paragraph on page 29 which states: **"There are no known automated channels in Mexico, including weather..."** For the record, MSI Television designed and installed an automated news and weather system last year in Mexico City that is more advanced than anything currently in place in the United States or Canada. This system consists of four remote weather stations which feed meteorological data from various locations around the city to the headend via phone line. These data are received and processed by a microcomputer system which controls character generator displays of the weather and causes the weather data from each area to be displayed in turn for one minute. The microprocessor analyzes the various weather parameters and gives a qualitative interpretation of the weather in addition to merely displaying the numbers. Thus, the temperature is described as being "cold," "cool," "temperate," "hot," or "very hot"; the winds as being "light," "moderate," "strong," "very strong," or "hurricanes"; the precipitation as being "none," "light," "moderate," "heavy," "very heavy," and so on.

In addition to the weather display, provisions are made to add news to the channel, either via teletype or from a keyboard, as well as color slide advertising from a flying spot scanner and color photo advertising using a camera and card flipper. Color backgrounds are variable and a floppy disk memory is included with the package.

Your article confirms our experience, which has shown that the Mexican CATV engineers are a savvy group of people who know how to produce a quality product for their subscribers.

D. Kent Wright
President
MSI Television
Salt Lake City, Utah

Kent—

We stand corrected. Our primary sources for the background material on the current state of the Mexican CATV industry were operators in Baja, California. They told us that they went to Mexico City as 'infrequently as possible' and then 'only to dis-lodge a CATV application stuck in the SCT bureaucracy'. They apparently had not been there during the past year! Congratulations on such an innovative system... when can we expect the first similar system here in the United States or Canada?

I'm Mad and Not Going To...

"I do not understand the direction the FCC is leading us. First of all Zenith has closed down most of its U.S. manufacture of hand wired chassis and moved the operations to Taiwan and Mexico. This cost this country some 5,600 American jobs! Then I see where the Japanese have developed and demonstrated 2 foot earth receiving terminals which include the complete dish antenna, an antenna mounted pre-amplifier demodulator and the system produces a 43 dB signal to noise ratio at video. But the FCC rules that we can't employ CATV terminals smaller than 4.5 meters and this precludes us as a nation from even staying current with the latest and most cost effective technology. What in the hell is wrong in this country that things like this happen? No wonder the United States is losing its leadership in technology. We are regulating ourselves right into second (or third, etc.) position by deciding before its done that it can't be done!"

Joseph D. Burgess
Allentown Cable TV
Wellsville, New York

Joseph—

The FCC is probably only slightly blameable for the loss of the Zenith TV receiver construction facility in this country. But certainly other government agencies, such as the people at the Commerce department should have seen this one coming. As for the experimental Japanese satellite dishes and receivers... if there is one phrase that scares the broadcasters worse than 'cable TV' it is 'direct satellite reception'. As long as we have such a powerful broadcast lobby in this country, we'll never see satellite reception in the homes on a mass scale.

Re-refinancing

"I always read CATJ cover to cover. I find time to do that even though I've been unable to shake loose for conventions, CCOS, etc., this past couple of years and I wanted to compliment you on your 1978 CATV Industry Survey.

"That sort of thing is meat and potatoes to an appraiser who must constantly scan the industry to see what it is saying. Chart No. 5 was mighty interesting and while it is excellent to see the activity in new construction and expansion, etc., there is one category that is truly reflective of the "financial thinking" of our industry overall; and it may be unfortunate thinking.

"A very low percentage seem interested in "re-financing" their operations.

"Since there are less and less "Opportunities" for system acquisition (practical ones anyway) and new systems aren't found viable under every rock, it is easy to see why "re-financing" is put in a lower interest category. However, it has been my experience these past years while we've plied our trade that almost all systems we've appraised for various reasons could and should look hard at re-financing. (REMEMBER, we don't finance systems... just appraise them. No "profit-motive" here... just a word to our fellow operators.)

"An almost typical situation might be the following:

1. "Older" system, free or practically free from any debt.
2. "Well depreciated"
3. Retains about 50% of each and every pre-tax dollar.
4. Closely-held ownership, corporation, or sub-chapter S.

"This type of system has an excellent "track record". Its income stream is well established. Almost no "risk" involved in lending 75% to 80% of its market value (yes, that's where we come in), at very competitive interest rates. Therefore, re-financing is a better choice than keeping the equity tied up in the system. Leveraging another investment (perhaps outside CATV?) produces a better rate of return on the "CATV-equity" than it is producing in the static CATV system where there is little yearly growth in revenue (either from community growth, saturation growth, or rate-increase.)

"Many of our clients have watched half of their net-income go to Uncle Sam, thought about sale of their system, and moaned about what they would do with the Capital Gain. Our studies have indicated they might (if conditions are right) have their cake and eat it too by re-financing the existing system and putting the Capital to work. For the debt-free, almost totally depreciated, owner/operated system it's good business."

Gary A. Dent
Appraiser
Dallas, Texas 75208

Gary—

There is probably little question that many closely held system operations are a boon to the IRS. There is another factor as well. A fully depreciated, fully paid for business 'looks bad' to would-be regulators and public interest types who like to dig around and find "exorbitant profits" and then cry 'regulate!'. Sitting around clipping coupons may be relaxing, but it is not always good business.

Do Your Own Thing. . .

"Synanon is a California community of approximately 1,350 people. Our concept is to provide an advanced, experimental community where there are no drugs, tobacco use is prohibited, all diets are controlled without sugar and include high fiber content foodstuffs. This is essentially a self sustaining community where all of the community works together to provide for not only our needs but to also provide the opportunity for the citizens of the community to advance and learn as far as they wish to go or their capabilities will take them.

"The number of people who have undergone the Synanon experience now tops 15,000. About a third of the present 1,350 population are so-called 'squares' who are here not because they have drug or other problems; they simply like the highly structured way of life.

"I am looking for versatile electronic technicians to come and live and work in Synanon for a year. They can be married; we have many job opportunities for women as well. The pay is not in money, but in rich living with everything provided (housing, food, etc.) including medical and dental care. The standard of living is far above average here and we provide what we call walking around money or \$35. per month.

"The jobs open would include work on installation, maintenance and repair of several community CATV systems as well as custom building electronic equipment of all types and formats. Basically the technicians I seek will assist me in doing all of the electronic work required for this community.

"Anyone interested may call me or send a resume."

Rudy Stefenel
Communications Consultant
Synanon Foundation
P.O. Box 112
Badger, Ca. 93603

Regarding Aeronautical Interference

"Thanks for reviewing in your November **Technical Topics** FCC's new rules on cable TV operation in the aeronautical radio bands. Widespread knowledge and application of the procedures in those rules should prevent any harmful interference to aeronautical radio services.

"I would, however, like to correct a possible misinterpretation arising from your numbered paragraph 1. You state that any cable system having certain power levels in the aeronautical bands and being within 69.1 statute miles of an aeronautical radio service must take the actions described in your paragraphs 2 through 8. In fact, the new rules require that all systems having signal levels higher than 10^{-5} watts at any point in the system (in the bands of interest) must take actions covered in your later paragraphs.

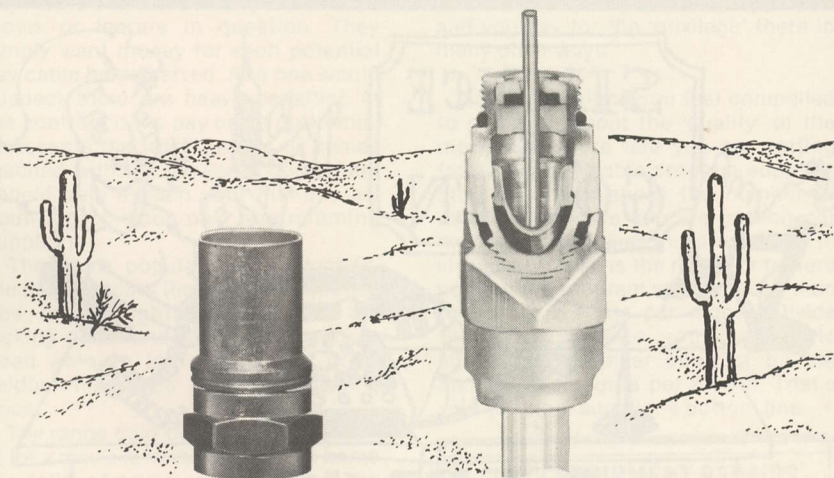
"The 69.1 statute mile radius, derived from the 60 nautical mile service radius typical of certain aeronautical radio stations, enters only in the following way: If there is an aeron-

autical radio station actually operating within 60 nautical miles of any part of the cable system, and the carrier frequency of the radio station is 'near' that of the cable frequency, then the cable operator must either change frequency or obtain a waiver from the Commission. 'Near' in frequency means within 50 kHz plus the cable system frequency tolerance in the case of the instrument bands (108-136 and 328.6-335.4 MHz) and within 100 kHz plus the cable system tolerance in the communication bands (118-136, 225-328.6 and 335.4 to 400 MHz). The frequencies listed in your paragraph 2 (121.5, 156.8, and 243 MHz) are protected from cable TV operation higher than the cutoff level of 10^{-5} watts, re-

gardless of whether or not there is a radio station operating within 60 nautical miles.

"The question of whether a cable system is affected by the new rules is really answered first on a frequency basis: The answer is 'yes' if the system is using any frequency in the bands 108-136 and 225-400 MHz. If so, then the operator must (1) take actions you describe (details are in Sections 76.610 and 76.611 of the Rules) and (2) take further actions if any part of the system is within 69.1 statute miles of an aeronautical radio station using a 'nearby' frequency as described.

"A new publication available from the **National Technical Information Service**, 5285 Port Royal Road, Spring-



Dry as Death Valley!

You know the problems moisture can cause in your system. Now you can moisture proof your system with two new product developments from the Innovators at LRC.

A series of "F" style connectors is available from LRC that provides a moisture barrier from the jacket to the "F" connector and continues that protection right through the "F" female connector. Laboratory testing has shown, when the correct connector for your cable is properly installed, the seal is effective at over 20 psi.

For total system protection you'll want to add the feed thru

connector from LRC without a center pin, the cable center connector does the job. A 40 psi moisture barrier is obtained from housing to cable for all three size cables. The new design eliminates the need for an expensive, more complex pin style connector. But you still have a choice, center pin or not, and both are moisture proof.

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CANADA THRU: Electroline TV Equipment, Montreal, Quebec

field VA 22161, will be helpful in determining whether a cable system is within 60 nautical miles of an 'on frequency' aeronautical station. The publication, "Aeronautical Frequency Assignments Near Cable Television Carrier Frequencies," NTIS number NTISUB/D/239, will be updated quarterly, and is available on a subscription basis for \$36 per year, or \$10.50 for single copies (\$3.00 in microfiche)."

Robert S. Powers
Cable Television Bureau
Federal Communications Commission
Washington, D.C. 20554

Bob—
Hopefully everybody now understands the issue. If you have any cable

carriers on your plant within 100 kHz of 121.500 or within 50 kHz of 156.800 or 243.00, you are required to move these carriers outside of the 100/50 kHz windows now protected by the new rules. This applies to everyone anywhere. Then if you have signals between 108 and 136, and/or 225-400 MHz, you must institute regular (annual) radiation measurements of your plant (write everything down, keep your logs, describe what you do and what you find and how and when you fixed it if the radiation levels found exceed 20 microvolts per meter at 10 feet). For the full story see pages 61/62 for December (1977) CATJ. Our only complaint with all of this is the last paragraph of your letter. While a subscription to the NTIS publication is not mandatory, and is

fully optional, there is a limit to just how much of this government paperwork the average cable system can be expected to keep up with. You guys can turn out paperwork faster than we can fold, spindle, mutilate or shred. Enough is enough!

VD Ruled Out

Just when it appears as if the video tape market (Beta-Max and all of the other Japanese outfits) have finally gotten their act together for a concentrated rush on the American (and world wide) video market, along comes another technical breakthrough that will surely have some major impact on the way we watch video in the years ahead.

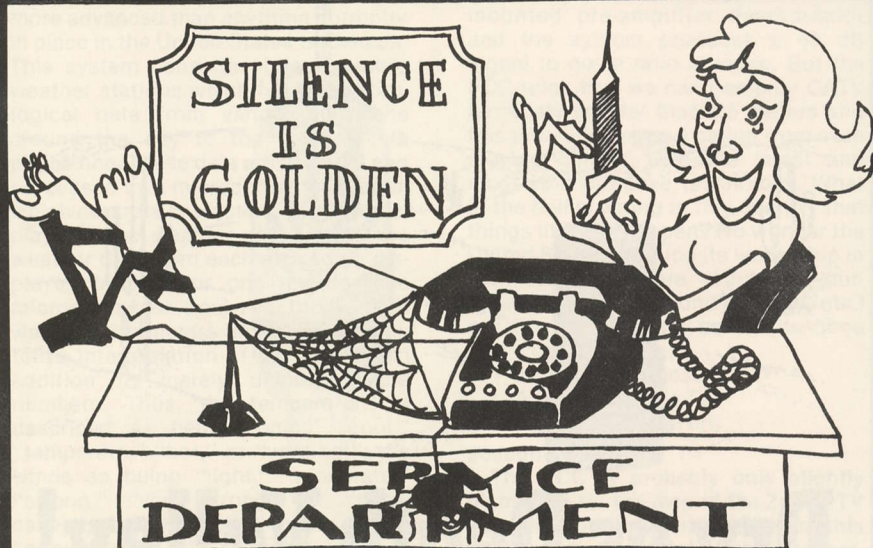
For some years there has been an engineering struggle between video tape and video discs. There are several operational and even being-marketed video disc systems around; principally in Europe. However the high cost of the process and the lack of quality for the play back units has kept the technology behind the emerging video tape industry.

Alas, perhaps the tide has turned. Matsushita has demonstrated a production type 'simple' video disc system in Japan and it has all of the earmarks of a commercial marketplace winner. The VISC system (the Japanese originally wanted to call it the 'VD System' but their American subsidiary nixed that one... what a pity fellows!) puts up to 60 minutes of video (45 dB signal to noise, NTSC color, resolution of greater than 270 lines) and two channels of hi-fi audio (20 kHz bandwidth, 60 dB signal to noise) on a single side of a two sided 12 inch disc; total playing time for both sides 2 hours. The player (according to Japanese reports) utilizes common electronic parts, requires only one special part; a diamond pickup stylus that will last 'over 1,000 hours' according to the report. Unit has only two knobs, one of which controls a 'search control' so the user can speed ahead looking for a particular segment on the disc.

Pricing? In Japan, the initial units are going to retail for between \$480 and \$600 (compare with VTR pricing in \$1,000 range) and pre-recorded discs in the 20-50% above standard pricing for stereo audio discs range. Dis-advantage of course is that system is playback only, utilizing pre-recorded material. However pricing for playback only mode is low enough that substantial market could well develop. Matsushita is closely aligned with JVC which started nearly 50 years ago as 'Japan Victor Company', of RCA parentage.

Active vs. Passive Antennas

In the October issue of CATJ, page 41, Rod Hurlburt (Marketing Manager for the Harris Corporation Antenna Operations in Kilgore, Texas) wrote "(because of increasing costs and eroding profit margins) I think you will see more major companies, such as ourselves, no longer actively pursuing the TVRO market".

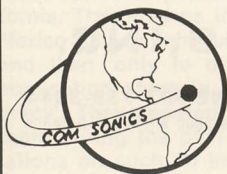


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(Soft or Fuzzy Pictures)
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In our **November** issue, in **Coop's Cable Column**, we wrote "(because of eroding profit margins) **Suppliers will follow the lead of ITT or RMS/I and get out of the CATV field.** . .".

Hurlburt's letter in the October issue indicated to us that his company would no longer be chasing CATV business. Hurlburt says 'not so...we are not going to troop all over the country attending shows with exhibits and the like, but we are still quoting CATV terminals'.

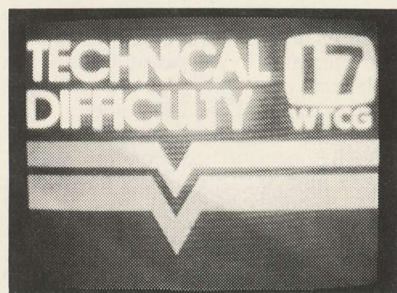
The key word, apparently, is 'actively' (pursuing). RMS/I is now the antenna supply arm of Harris Corporation and Harris is where another TVRO veteran now hangs his hat. Don Buscher, the guy who was so helpful while at ITT in getting the small aperture terminals approved at the FCC, is now working at Harris in Melbourne, Florida.

When Super 17 Fails. . .

The December issue of CATJ dealt with a receiver failure at your TVRO site, and we happened to select (for the theme of our article) the loss of 'Super 17'. Well, it can also happen another way. . .

For example, on Thanksgiving Day Super 17 was cut off at the Atlanta uplink site on several occasions. Southern Satellite Systems leases the uplink facility and WTCG off-air signal demodulator system from RCA (Atlanta). It is the responsibility of RCA to maintain the off-air demod site as well as the uplink transmitter going to SATCOM II.

The first failure occurred around 9 AM EST when the audio 'went down'. The problem lasted about 30 minutes and was then repaired. Next the video and audio went at the demod point (the uplink carrier from Atlanta continued to play but with a blank screen and no audio). This lasted on and off for an hour or so. Just when everyone thought they were out of the woods, WTCG had its own failure and for around 15 minutes the uplink had no signal to feed to SATCOM II.



One of the first things you should do when you experience a failure is to check with **another** nearby TVRO user to ascertain that the failure is universal. If it is, then you might want to call down to Atlanta to ask that somebody get busy and repair the down gear. Here are two numbers that will help you locate somebody to do this:

- 1) **RCA Earth Station**—Atlanta 404-434-1413.
- 2) **WTCG Backup**—Atlanta 404-876-1122.

Call the first number first. If nobody

answers, try the second one. Usually the first number will find someone on duty at the RCA site but there are night-time periods as well as holidays (such as Thanksgiving!) when you will have to move to the second number to report the signal outage.

Pay Cable Movie Pricing

Movies for pay-cable (HBO, Showtime, Fanfare or Home Theater Network) are rented to the pay cable groups by the movie rights owners on a pretty inflexible schedule. Knowing how this happens will make you a better informed cable system operator providing these features to your customers.

The movie rights owners want maximum return per home for each release provided to cable television. They care not whether all, or some, or none of the pay cable homes **actually watch** the movie or feature in question. They simply want money for each **potential** pay cable **home** served. And one would suspect there are heavy penalties in the contract if the pay cable outfit misrepresents the total number of homes reached with the movie products (that should help explain **your** monthly accounting to your pay programming supplier).

The more popular the production, the more it costs the program supplier. The movie rights owner sets the 'asking price' and from what we have been able to learn the final price seldom fluctuates below the asking price.

The range paid by the pay cable outfit for a movie is in the **ten cents a home to a dollar a home** range. Sometimes the rights owner wants a buck a home for say **six** showings of the feature; and the pay cable programmer 'negotiates' for say 50 cents and **three** showings. The number of showings is about all that is negotiable, although the rate for the feature does not necessarily divide down by the exact proportion that a reduced number of showings might indicate. Remember that the pay programming supplier whom you 'buy from' has to supply product and cover his own operational costs (including program distribution via satellite or tape, his own promotional efforts, travel and engineering and so on. . .) out of his share of what you collect per month for the pay-channel programming. So if the program supplier sends you 15 features a month and collects \$3.00 a month from you, he has to make that \$3.00 cover his cost of the features (at some 'negotiated amount per home') and his operations.

A package of 15 movies (shown that month, perhaps several times each) **might** average 30 cents per home each. That comes to \$4.50 per home per month; obviously that **cannot** fly when there is say \$3.00 per month paid by you. Yet a big movie, such as Network, may cost 50 cents for the rights (and say 5 showings during the month). So by whatever amount movies such as Network drive **up** the average, other features bought for showing that month must bring the average cost **down**; down to where the pay cable

programming outfit does not go broke being a nice guy providing you with good quality movie fare.

The motels and hotels that have the videotaped productions of generally the same movies that you are getting on your pay cable at about the same time have a different kind of deal. If the movies go to all rooms **unrestricted** (i.e. without the 'guests' paying a special fee for the showing) the normal charge for the rights is ten cents a room a showing. If there are 1,000 rooms, that works out to \$100 each time the movie is shown. Regardless of whether anyone watches the movie or not. That kind of operation has not lasted long in most areas; the hotels and motels cannot afford that kind of overhead except in rare situations and so the 'pay for it if you watch it' format evolved. Only towns like Las Vegas have been able to sustain the mass showing approach and you pay for the 'privilege' there in many other ways.

So the next time you feel compelled to complain about the 'quality' of the movie or feature fare you are getting from your pay cable program supplier, stop and think about the number of different features you are getting per month. And keep in mind that in virtually no case is the movie or feature costing the program supplier less than ten cents a home per month. **Divide** the minimum rate your pay cable supplier gets under contract by the number of features per month. That's your program supplier's bottom line.

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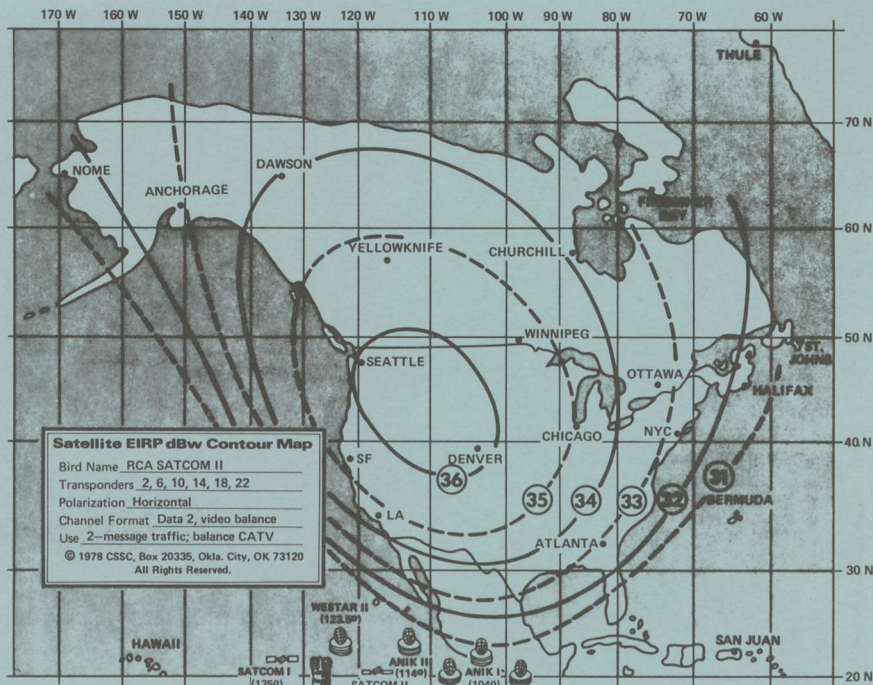
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Now let's forge ahead with the matter of switching to vertically polarized channels. Aside from your having to add a new feed antenna to your receiving antenna (plus a new LNA for the vertical feed portion and a new feedline for that feed portion), there are other considerations to adding **your first** vertically polarized SATCOM signal. RCA has to be sure it can get a signal to you. If you look carefully at maps one and two, you come to the conclusion that the map one channels have better coverage of the basic 48 states, and transponders 2, 6, 10, 14, 18 and 22 (map two) start to have problems even with (larger) 10 meter antennas in the south of Florida. Remember, the key here is to be inside of a 33 dBw EIRP contour, or better, with your smaller-than-ten-meter antenna. You can be outside the 33 dBw contour zone, and still make it play, but if you are so located and you have a smaller-than-ten-meter-antenna, your pre-amplifier (LNA) had better be a good one. As you get down to the 31 dBw EIRP contour zone you are skirting sparklies even with a 10 meter dish and a 120 degree LNA as far as the FCC's 3 dB margin is concerned.

Now let's look at our third EIRP map; this one shows the EIRP dBw contours for vertically polarized channels 3, 7, 11, 15, 19 and 23 on SATCOM II. Opps... what happened to the eastern portion of the good ole' USA?

What you see here is the crux of the SATCOM II vertically polarized transponder problem. This particular antenna (called the southeast reflector because it is so located on the bird itself) is designed to provide enhanced coverage not to the continental 48, but rather to Alaska. In fact, Anchorage is just about on the 37 dBw EIRP line. Virtually all of Alaska is inside of the 36



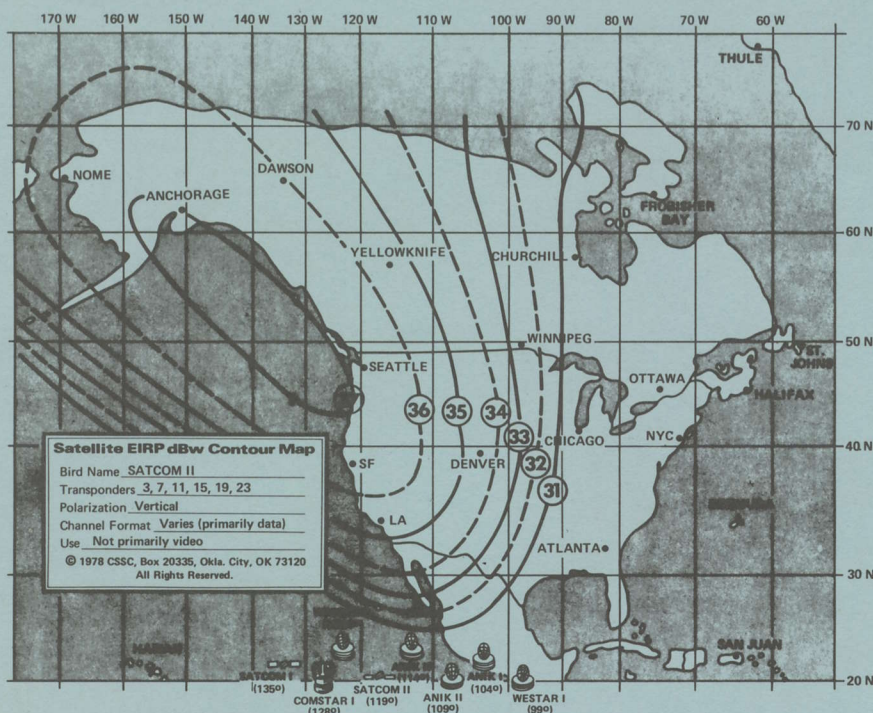
MAP TWO

dBw EIRP line. But check out Chicago (around 29.5 dBw) or Atlanta (around 27.5 dBw). There goes the ballgame for 4.5 meter terminals east of the Rockies. And if you go very far east, even the 10 meter terminals would not play.

So RCA has a problem. They have a set of vertical channels (3, 7, 11, 15, 19 and 23) on SATCOM II that don't really do much for continental 48 coverage. What about the other set of vertical channels on SATCOM II, you ask? We'll not bore you with another map, but we will point out that on the southwest reflector for SATCOM II vertical channels 1, 5, 9, 13, 17 and 21 are in better

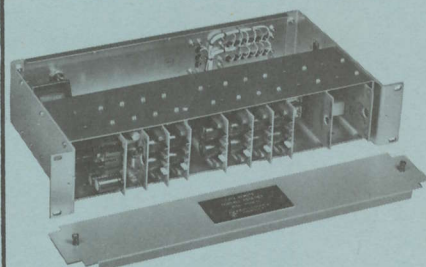
shape (Chicago 34.5 dBw versus 29.5 dBw and Atlanta 33 dBw versus 27.5 dBw).

And RCA could not, therefore, use vertical transponders 3, 7, 11, 15, 19 and 23 for coverage of the continental 48. Not on SATCOM II anyhow.



MAP THREE

CATV



REMOTE CONTROL RECEIVER-SWITCHER

MODEL 3000R-10A 4-FUNCTION **\$1095***

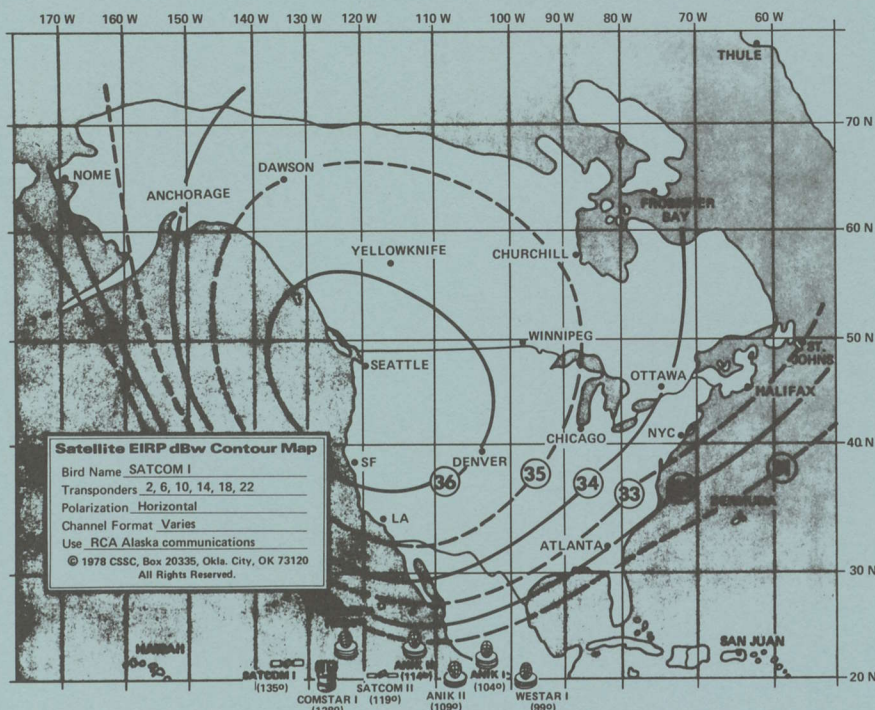
Does your computer know when a ball game is going into overtime?

If not, you need a system as shown above to permit your engineer to take control from his home or office. Switch programs from a dial-up telephone line and/or microwave or radio link.

*Price subject to change without notice.

Write for complete data:

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100 Housel Ave., Lyndonville, N.Y. 14098

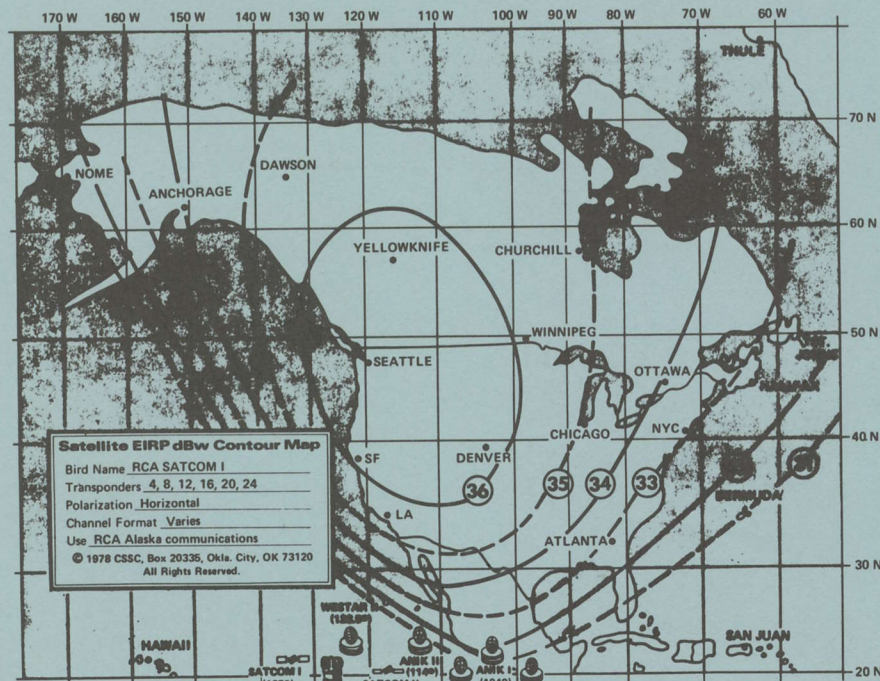


MAP FOUR

Now what about SATCOM I? Well, it is located at 135 degrees west. Until now it has been largely dedicated to RCA Alaskom Communications, an RCA subsidiary that is providing television, telephone, and message traffic service to Alaska from the continental 48 and intra-state within Alaska. Time for another map.

Map four is the EIRP contours in dBw for SATCOM I for transponders 2, 6, 10, 14, 18 and 22. Let's take transponder 6 (WTCG) on map two and compare the two. If you are west of a line

from Chicago to El Paso, you are about in the same shape with SATCOM I and II. But further southeast you start to have problems. Take Atlanta for example; on SATCOM II you have an EIRP of around 32.8 dBw while on SATCOM I you have an EIRP of around 32 dBw. Still not a big deal, although that 0.8 dB could hurt. And when you get to central Florida—guess what happens. You are also around 0.5 to 0.8 dB worse off with SATCOM I. Now go north to New York City. You might expect to be worse off with SATCOM I, but guess again. You are actually better off by around 0.6 dB



MAP FIVE

with SATCOM I. Now that deals with EIRP levels only, and not such things as what look angles do to antenna temperature. We'll look at that problem next month.

OK, so most of us would get by on this set of transponders pretty much OK, in pure EIRP terms, if SATCOM I is the new CATV bird. Time for another map.

Map five is SATCOM I horizontal transponders 4, 8, 12, 16, 20 and 24. The comparison here is to map one. On map one (SATCOM II) if you are west of a line drawn from Ottawa (Ontario) to New York City, you are in the 34 dBw or better EIRP. On Map five you have to be west of a line from Cleveland through Dallas to stay on the good side of 34 dBw. So again, there is some 'fall off' towards the southeast. The difference in dBw is around 0.8 dB for points in the southeastern USA (favoring SATCOM II). We can see where HBO (for example) on transponders 20 and 24 might be unhappy with the switch, on behalf of their southeastern USA coverage cable customers.

Which brings us to our final map for this month's discussion. Map six shows the EIRP contour for SATCOM I's vertically polarized transponders 3, 7, 11, 15, 19 and 23. A quick look indicates that New York City is located at around 31.8 dBw while central Florida is around 30.8 dBw. Not good in either case and any programmer going on this particular set of vertical channels will be dis-advantaged along the far eastern seaboard. But not as dis-advantaged as they would be on transponders 3, 7, 11, 15, 19 and 23 on SATCOM II! (See map number three.)

The balance of the vertical channels on SATCOM I are in better shape; channels 1, 5, 9, 13, 17 and 21 show New York City to be at the 32.9(5) dBw contour point (that's around 1.15 dB better than the other odd-channel set) and central Florida is around 31 dBw (perhaps 0.2 dB better than the other odd channel set).

Where does all of this lead us? Circautiously to the truth we hope.

Taken as a group, the SATCOM I vertical channels are going to be 1 dB (w) worse off on the east coast than SATCOM I horizontal channels. However, when dealing with SATCOM II vertical channels, transponders 3, 7, 11, 15, 19 and 23 are not even in the running east of the Rockies; although transponders 1, 5, 9, 13, 17 and 21 are around 1 dB (w) better in the east than the same channels on SATCOM I.

Let's try to sort all of this mess out.

On SATCOM II we have 10 horizontal channels possible for CATV service (14 is reserved and 12 is broken) plus vertical channels 1, 5, 9, 13, 17 and 21. That's a total of 16 video channels that could be used by CATV.

On SATCOM I we have 12 horizontal channels (to be best of our knowledge none of the F1 channels are 'broken') plus some quantity of vertical channels. The some quantity works this way; the further east you are, the bigger your receive antenna and the

Coop's cable column



**bob cooper editor in chief
CATJ**

F1 vs. F2—No Controversy

At the Western Cable Television Show in November, as we reported in our December column, RCA was around and about suggesting that all CATV traffic might be moved to SATCOM I, or F1 as they call the bird. And as noted last month, the response from the cable personnel on hand was anything but enthusiastic. No matter how you hack it, changing the antennas from 119 degrees west to 135 degrees west has got to be a problem for a few systems.

We heard one software (i.e. programming supplier) proclaim "They are

going to have to climb over my dead, lifeless body to get me to move...". Others were less vocal in their opposition.

In the interest of fair journalism let's look at RCA's view for a few paragraphs. Unfortunately getting information out of RCA is very difficult, and this makes my making a case for them more tedious. So I admit going in that the best I can do is to examine the facts as I have them before me, and then attempt to sit in RCA's position to arrive at the apparent conclusion they seem to have drawn. If I draw some erroneous conclusions or some of my

facts are incorrect, that's RCA's fault, not mine. I have asked repeatedly for the straight scoop but to date it has not been forthcoming.

First of all, the CATV programming business is exploding. As noted last month, and as listed in tabular form, we now have CATV program commitments on SATCOM II's horizontal transponders 2, 4, 6, 8, 10, 16, 20, 22 and 24. Plus another CATV program service has an option on transponder 18. Transponder 14 is filled with data or message traffic on a regular basis, and, transponder 12 is sick. So when the option on 18 is exercised (probably before you read this), there are no more horizontal channels remaining. Yet if you can believe RCA's public utterances, there are at least two and perhaps three more would-be-transponder-entors waiting in line to get a 'channel' of their own for CATV program service.

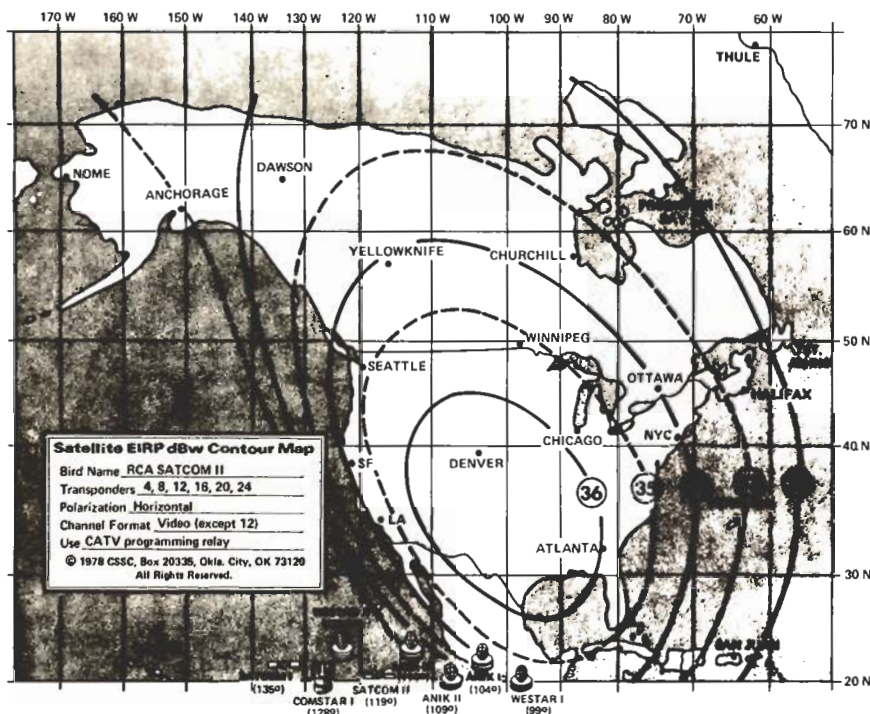
The question is where do you put them, if you are RCA?

The most obvious answer is that after RCA runs out of horizontal transponders on F2, they start to lease out the vertical transponders. In case you missed the opening of all of this months back, the SATCOM family of satellites have 24 channels. The even numbered channels transmit a horizontally polarized signal and the odd numbered channels use vertical polarization.

Now before we go any further, let's look at some maps. **Map one** is a recently completed map from a new set produced by **CSSC (*)** and it shows the familiar SATCOM II footprint for horizontal transponders 4, 8, (12), 16, 20 and 24. The map has been expanded beyond the continental 48 and we'll see why shortly. The 36 dBw EIRP is the strongest signal area and the map carries the levels out to the 31 dBw EIRP region. For reference sake, a 4.5 meter receive antenna with a 120 degree LNA will produce sparkle free pictures anyplace inside of the 34 dBw contour; and if you want to fudge a little on your FCC mandated 3 dB 'margin', out to the 33 dBw lines.

Map two is a similar map for SATCOM II horizontal transponders 2, 6, 10, 14, 18 and 22. The same calculations apply as with map one. This set of horizontal transponders is known in the CATV biz as the 'northwest antenna channels' because the strongest EIRP levels are centered in the northwestern region of the United States. In case you have not figured it out yet, RCA's SATCOM II bird has **two different sets** of horizontally polarized transmitting antennas on 3.7-4.2 GHz.

*A set of nine two color 8 1/2 by 11 EIRP contour maps for SATCOM I, SATCOM II (all vertical and horizontal transponder sets) plus ANIK (I) are available postpaid for \$10.00 from CSSC, P.O. Box 20335, Oklahoma City, Ok. 73120. Include payment with order.



MAP ONE

lower noise your LNA must be if you are going to use the vertical channels. If we take the 33 dBw EIRP line as a breaking point, east of a line from New York to Atlanta you have problems with transponders 1, 5, 9, 13, 17 and 21 while for transponders 3, 7, 11, 15, 19 and 23 that line runs from Toledo to New Orleans. Another way to look at it is to say that if you can get by with a 33 dBw EIRP contour, you are home free on 24 channels **west** of a line from **Toledo to New Orleans**, or, you are home free on **18 channels west** of a line from **New York to Atlanta**.

We started this whole exercise by suggesting that we needed to put ourselves in RCA's shoes and be looking for a solution to the CATV 'channel shortage'. If you agree with what has preceded this, you might be agreeing that for RCA the F1 move makes some sense. There is one more element at play here however. **Alaska**.

The Alaskan communications boom is almost beyond comprehension. And most of it is coming with satellite interconnection. The State of Alaska is picking up the majority of the tab (having all of that oil money is certainly not hurting their ability to envision new capital intensive projects!) and one of the 'pressures' the state is placing on RCA Alaskom Communications is for RCA to provide expanded television service to the Bush Country Terminals scattered across Alaska. Go back and look at map number three. Notice that the SATCOM II vertical transponders on 3, 7, 11, 15, 19 and 23 have a fat 37/36 dBw EIRP contour into virtually all of Alaska. That extra dB or two (compare with map number six) on the ground in Alaska works to the direct benefit of RCA Alaskom Communications. Remember that one of the things RCA is

doing in Alaska is splitting 40 MHz transponders into two halves and running **two sets** of video programming **per channel** (23 in this case) into Alaska. The video signal to noise ratios measured using this format are in the 48-49 dB region. Or just on the edge of sparklies. Now if RCA could get another dB or two or even three out of their transponder system, they'd make a big improvement in the quality of the television delivered on the half transponder format into the Alaskan Bush Country Terminals. Transponders 3, 7, 11, 15, 19 and 23 can give them that kind of edge on SATCOM II. And that's something RCA cannot do with SATCOM I.

So when you wrap it all up, the move to F1 makes sense to just about every aspect of RCA's satellite business; as a **corporate business decision at RCA**. Now as to whether it makes sense to CATV systems in the continental 48... well, that is another matter indeed!

Fuller Use Of The Bird

Over the weekend of the 19th-20th of November the National Organization for Women met in Houston, Texas. For nearly three days some of America's best women met to debate a national program for womanhood for the coming year. A large portion of this national conference was carried live and without interruption by RCA's SATCOM II on transponder 18.

Those of us who have the capacity to 'scan the satellites' frequently run into unannounced, unscheduled events being transmitted from point 'A' to some other point or points. These transmissions run the gamut from news feeds (primarily NBC on SATCOM, because of the RCA parentage) to a full selection of Sunday pro football



games (can you imagine having a selection in your home of virtually every football game being played on a given Sunday!), and a host of non-broadcast video services. Most of these transmissions are either of no interest to the public at large, **or their use would violate a host of rules, regulations, contracts and laws** (such as piping out the full range of Sunday pro football games).

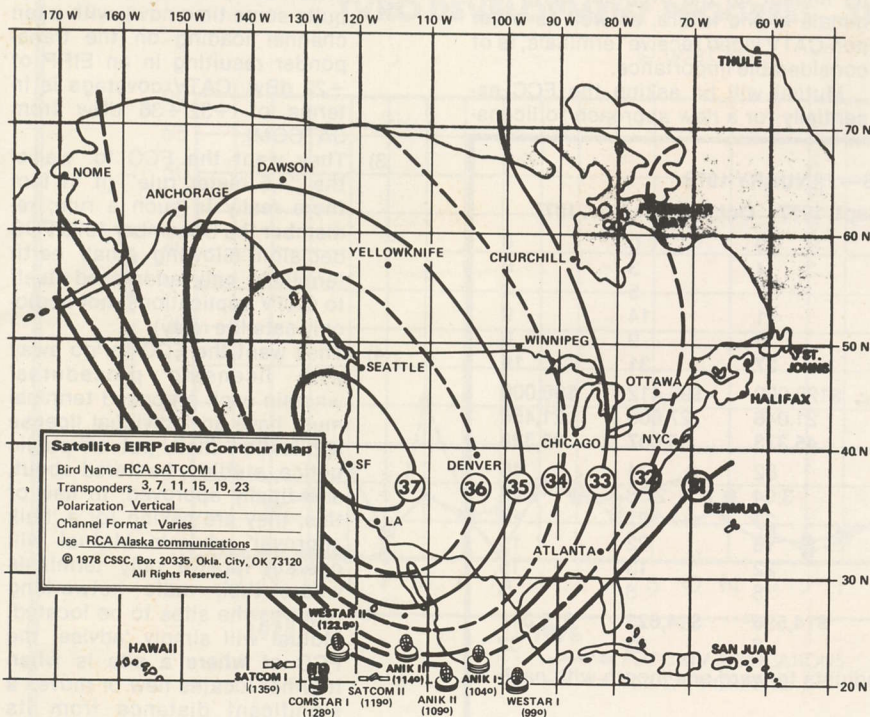
The NOW Conference was an exception to the above caveats.

Now I have no idea who 'owned' the rights to the transponder 18 coverage of the NOW Conference. Moreover, had I not been conducting a series of tests on Saturday the 19th its presence on transponder 18 would have gone unnoticed by me. As most of us are aware transponder 18 is on the SATCOM II "Northwest Antenna", and 18 is the soon to be home of PTL. But regardless of who provided the coverage, or who owned the rights, American cable missed a fantastic opportunity to provide into the cable homes some of the most illuminating hard-news coverage of the year when this programming/coverage was (1) not generally announced in advance of the coverage, (2) and the way cleared for impromptu 'carriage at will' by cable systems with the capacity to do so.

Sitting down and 'watching' ten or more hours of NOW Conference coverage even if available in the home would have resulted in a scant (if measurable) dent into the ARB or Neilsen ratings for that weekend. But it would have been an opportunity for the women of America to participate (even if in absentia) in a Conference that may well have more direct bearing on their lives in the coming years than any other singular event of recent times.

Sombody dropped the ball. RCA or NBC (one of the two had to be involved) could use but scant minutes of the coverage in national network news broadcasts. Local stations, with news crews in Houston, could do little better. Cable could have done the full job, gavel to gavel. We blew it because we didn't have any advance notice. Sombody needs to think about this problem and to find a solution.

And just in case you think you didn't miss much, the November 20th debate on (feminine) sexual preferences was a humdinger. It occurred right in the middle of prime time. What a shame so few of us were enthralled by the dialogue.





A formal announcement late in November from **Western Union** (WESTAR I and II), **California Microwave** (prominent supplier of satellite gear in Alaska) and the **Mutual Broadcasting System** (MBS—the nation's largest radio affiliate network) sets the stage for the next quantum leap in small antenna system technology for space satellite receive systems.

Mutual has contracted with Western Union for use of WESTAR I for the relay of up to four 15 kHz wide audio channels to MBS station affiliates. The system will utilize ten foot (3.05 meter) receive antennas, 180 degree K LNA devices, and California Microwave receivers designed to capture the 75 kHz deviation of the SCPC (single channel per carrier) signals. Cal Microwave says the systems will have a 50 to 15,000 Hz baseband audio signal to noise of greater than 65 dB, harmonic distortion of under 1%.

And there will be no fewer than 400 such terminals and as many as 500

starting with a token 12 units for field testing and then moving to 50 delivered systems per month after the field evaluation period.

As all CATV types well know, the FCC has to date not taken a firm stand favoring satellite receive terminals utilizing antennas smaller than 4.5 meters in aperture parabolics although several 4.34 meter diameter horn antennas (AFC primarily) have been approved for CATV system use. The bottom line is that this is new ground, and during December Western Union and Mutual were to file before the FCC their extensive application requesting FCC approval for the new 'smaller-than-4.5 meter terminal' approach.

Other than this being significant new direction for a fast moving technology, its impact on the eventual CATV terminals of the future, as well as other non-CATV video receive terminals, is of considerable importance.

Mutual will be asking the FCC essentially for a new approach to licens-

ing of earth receive terminals. The bottom line here is **they want to do away with individual application by application licensing procedures** in favor of a 'bulk permit' to install terminals where and when they wish.

Western Union has been trying to interest a major (radio network) user in satellite program delivery for several years. More than two years ago ABC showed considerable interest (ABC operates four versions of their radio network and has a significant Bell landline bill for signal relay). To the engineering people at ABC, 'small aperture terminals' seemed the only way to go. However, when CATA and the CATV industry came along 18 months ago with a formal request for approval of small earth terminals (for CATV), ABC management (**as opposed to engineering**) decided they could not do battle with the CATV application and still work towards their own use of small terminals for radio networking. So they backed off and Western Union then went back on the street looking for interest. Mutual showed that interest, although NBC (inspite of their RCA parentage) also showed considerable interest for awhile.

The FCC has been kept reasonably well informed of the intent of WU and Mutual through all of this, and spokesmen for both told CATJ **"We have been given reasonable assurance that what we propose will eventually get through the Commission"**.

What they propose is this:

- 1) They are submitting applications for 12 'token' receive only sites; and there is no formal frequency coordination data being submitted for those 12.
- 2) They will use SCPC transmission (tests have been going on using WESTAR I, transponder 9, for quite some time now), with a ten channel loading on the transponder resulting in an EIRP of +22 dBw (CATV coverage is in terms of +32/+36 dBw from SATCOM).
- 3) They want the FCC to 'waive' the "4.5 meter rule" (if in fact there really is such a rule; **remember** the December 1976 FCC decision allowing small earth terminals **only** addressed itself to CATV applications, **not** audio-only satellite relay);
- 4) They want the FCC to 'do away with licensing procedures' wherein each proposed terminal must have an individual license application filed, put on public notice, studied, bantered about, and finally approved. In lieu of this, they are asking for a 'bulk approval' wherein Mutual will operate receive only terminals where their radio networking requires the sites to be located; Mutual will simply 'advise' the FCC of **where** a site is **when** it either locates new or moves a significant distance from its original reported location.

CATV TVRO STATISTICS—JANUARY 1978

Applications Filed/FCC	Sept. 1977	Oct. 1977	Nov. 1977
1) 11 meter		0	0
2) 10 meter		4	3
3) 6 meter		7	5
4) 5 meter		11	14
5) 4.5 meter		5	9
Total Apps		27	31
Cost Max.	\$120,000	\$96,412	\$96,000
Cost Min.	21,046	27,600	21,456
Avg. Cost	45,373	35,807	36,328
Channels Requested	82	74	46
Average Channels	3.04	2.38	2.42
Requesting WTCG	23	27	14
Requesting CBN	18	22	11
Requesting HBO	22	13	15
Requesting MSGE	8	8	3
Avg. Cost Per Channel	\$14,596	\$14,625	\$15,011
TVRO's Licensed/FCC	8	23	32

Note: Data compiled from FCC sources, adjusts forward one month with each issue.

What about interference? Are such sites not subject to the same terrestrial problems as say TVRO sites? Might not 500 or so of these run into all sorts of terrestrial signals?

Western Union has an answer for this in their filing. Using a mobile home outfitted with a portable 10 foot terminal WU went into the 'lion's mouth' in states such as Illinois, Ohio and elsewhere to develop real-world data on just **how close** you could locate to a Bell (or MCI, etc.) 3.7/4.2 GHz terrestrial station and **still provide** adequate audio service. They ran these tests during the summer of 1977, developed reams of data and they feel that:

- 1) Because of their particular audio format, they can get by in locations where (say) TV receive terminals could not, and,
- 2) Terrestrial interference may not be as big a problem as we as an industry make it out to be (or conversely, the FCC wants us to make it out to be).

And if there is interference at a site after Mutual puts it in?

- 1) Mutual will do their own coordination work, and based upon the Western Union field tests they know what type of locations to avoid. They'll do that on their own without the need for a formal frequency search and coordination.
- 2) If their 'paper study' for a particular site turns out in error? **Mutual will simply move the site.**
- 3) And as far as future protection from new terrestrial systems? Mutual says **"we cannot expect to 'be protected' from new construction if we don't go through the coordination procedure"**.

However, Mutual will be working out a system wherein they will have **notice** of pending **new** terrestrial paths so that they can (at their own expense) move an established site if new terrestrial interference develops.

The Western Union tests and demonstrations began nearly two years ago. For test purposes WU wisely built their demo-package around established and therefore readily understandable broadcast parameters. For example, rather than using the conventional satellite receivers with 70 MHz IF's, they constructed demo receivers with an IF at 88-108 MHz. In this way the demo was run by simply plugging the 88-108 IF output directly into a standard FM receiver. **"In this way the potential broadcast users could easily identify with what we were doing; we didn't ask them to learn anything new"**. Modulation for the tests was 75 kHz deviation (again, as with regular FM broadcast).

On WESTAR I the first operation with the token 12 sites will probably operate 'in the middle 1/3rd' of transponders 1 or 6. Tests conducted earlier on transponder 9 will continue until PBS begins regular use of WESTAR I (see associated report here).

The initial WU tests were planned around some then-current state of the art/cost effective gear. For example, 500 degree K LNA's using bi-polar transistors were originally considered adequate. But the state of the art has moved so rapidly for LNA's and GaAs FETs have come along so rapidly that the current spec is 180 degrees K. The LNA's will be broadbanded according to California Microwave, **"not peaked**

to the transponder in use for the MBS relay".

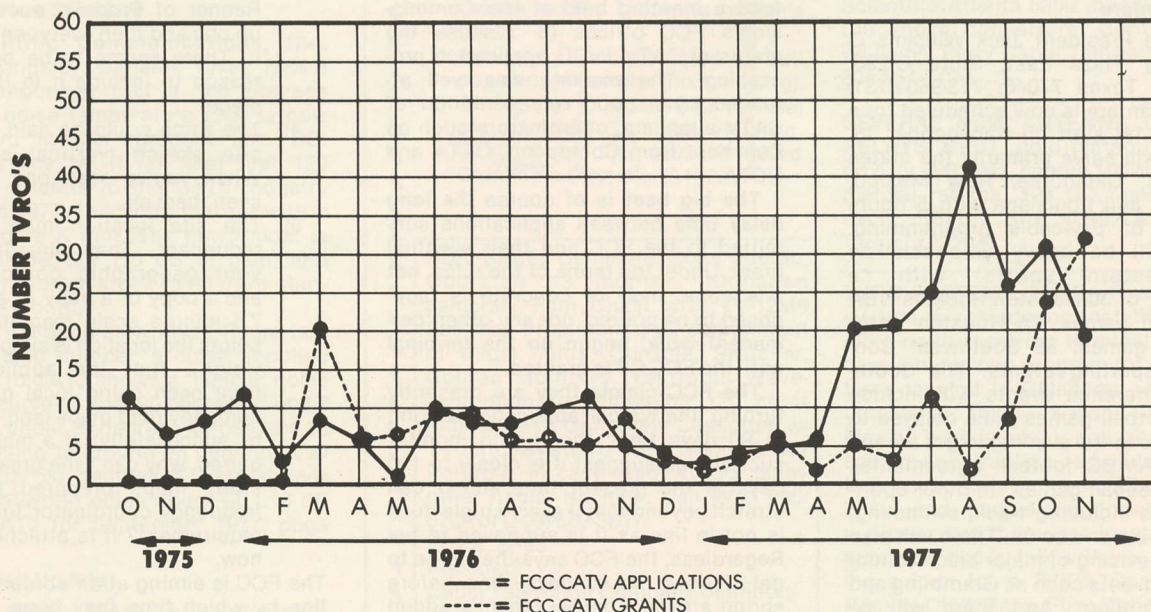
WU has conducted tests with Andrew Corporation for shrouded antennas. **"We expect that some of the terrestrial sites will require shrouds on the ten foot antennas"** notes WU **"and we are prepared to recommend them where necessary"**. Who will get the fat antenna order for around 500 of the ten foot antennas? The answer is apparently not yet clear. One Cal Microwave source says **"we are interested in both the fiberglass and metal skinned antennas"**. Another source at WU (which is not the buyer) noted **"We like the metal antenna best"**. If all of this escapes you, Andrew makes the metal antenna and Prodelin makes the fiberglass version. The MBS contract with Cal Microwave makes the California firm responsible for all of the bits and pieces, so it would appear the ultimate decision will come from California. **"We are not yet ready to go on the street with a firm bid request"** notes a Cal Microwave source.

The 65 dB signal to noise at baseband bothers some people who know their way around G/T and EIRPs. **"The best we could hope for with a conventional FM/FM system with the parameters of the satellite and the receivers is around 42 dB"** admits a WU source. **"However we talk in terms of peak programming to noise, not average, and that helps this equation a bit. Then we will be using some type of compander (audio compression system) and that will buy us quite a bit more; perhaps another 13 dB. And when you get to say 55 dB signal to noise, you really aren't far away from the 64dB being quoted"**.

Well, no more than 10 dB, anyhow.

TVRO DEVELOPMENT PROGRESS—THRU 11/28/77

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The MBS/WU announcement came as no great surprise; most people inside of the industry knew both firms were hard at work on the project. And it is **not** the only radio networking via satellite program going on. The **National Public Radio** (NPR—which is the radio equivalent of PBS in television) is just about ready to 'spend money' for their own satellite link system. A total of 203 terminals are planned by NPR, around 55 or so of these will be co-located with new PBS television receive terminals. In other words, PBS will allow the local NPR outlet to use their 11 meter receive antenna for NPR radio recovery as well. NPR is ready to hit the street with bid requests and to start spending money this month (January) and the sites (around 150) that will not be co-located with PBS will specify 4.5 meter antennas; and, NPR is approaching the whole project on a frequency co-ordinated-license by license basis.

So the FCC is about to be hit with 500 plus 203 or **703** (give or take a few) **applications for new receive sites** for radio networking. To those familiar with the FCC's present backlog on TVRO applications (all CATV and PBS and miscellaneous broadcast and the new radio terminals must go through the Common Carrier Bureau)...the picture is unpleasant at best. At the present time the FCC claims they are turning CATV TVRO applications around in 90 days time; but those who monitor such things say it is more like 105 to 115 days. The CCB has several new staff additions on board now, coming up to speed, but the impact of such a new load of applications is bound to take its toll.

"We admit that we may be hoping the FCC will look at this mushrooming use of receive terminals and simply agree that our approach for non-licensing is best" notes a Mutual source. When all is said and done, he just may have the answer.

About Fanfare

Fanfare President Jack Williams (5 Greenway Plaza East, Suite C-290, Houston, Texas 77046; 713-960-8731) tells us Fanfare is now scheduled for a February 1st start on transponder 16. Fanfare will serve primarily the states of Texas, Oklahoma, New Mexico, Arkansas and Louisiana with 5 hours per day of pay-cable programming. There will be heavy emphasis on 'southwestern sports' with 'a minimum' of 30 Houston Rockets NBA basketball games, 25 Houston Astro baseball games, 36 Southwest Conference sporting events. The Southwest Conference events will include seven football games (time delayed to 10:30 or so in the evening to get around the NCAA/ABC football agreements), 15 live baseball games, 16 other sporting events including track, swimming, diving meets and so on. There will also be live televising of major black school sporting events such as Grambling and Texas Southern. And there will be specials with a southwest flair, including the Huntsville, Texas Prisoner's

Rodeo, Willie Nelson music concerts, auto thrill shows and other events built around the southwestern appetite for entertainment.

As for movies, there will be 16 per month with **6 new** (premieres) each month. Movies shown will be 'booked' based upon audience appeal in the southwest. For example, some big-theater movies don't do well in the southwest while others that do well in the southwest don't do as well elsewhere. 'R' rated movies will be shown only after 9 PM.

Systems outside the five state 'target area' can utilize the programs (as an affiliate) **but** the programming will have a southwestern flair from start to finish. Rates will be along the 50-50 split favored by other pay cable channel suppliers.

Williams, who started in the cable business as a 'ground grunt' in Guymon, Oklahoma intends to be at Oklahoma, Texas and Arkansas state meetings this spring to explain his new satellite channel offering.

Fanfare was originally slated to begin operations January 15th; but has been delayed a few weeks while systems signed up for the service get their TVRO receivers in from the overburdened suppliers. Williams notes **"we will need around 70,000 Fanfare subscribers to reach the break even point with our service; a point we hope to reach at least by the early part of the third year of operation"**.

Will the regional sports + movies approach be tried elsewhere? **"I suspect it will"** notes Williams **"and if I were a betting man, I'd look at Los Angeles as the spot where it will show up next"**.

Towards Better TVRO Processing

On November 29th the FCC's Common Carrier Bureau and their Cable Television Bureau invited interested people from the CATV industry to attend a meeting held at the Commission's FCC offices to 'discuss the status of CATV TVRO application processing'. The meeting was well attended by a good representation of CATV suppliers, coordinators such as Dan Yost from Compucon, CATA and NCTA.

The big beef is of course the **long delay time** between applications submitted to the FCC and their eventual grant. Under the terms of the rules, not one cubic inch of concrete is 'supposed to be poured' nor any other 'permanent work' begun on the terminal until the FCC CP is granted.

The FCC claims they are presently turning 'the typical' application around in 90 days time; those who monitor such things suggest it is closer to 110 days at the present time and it can stretch beyond that if every single duck is not in line as it is supposed to be. Regardless, the FCC says they hope to get it down to 60 days time before spring arrives. They've recently added new people and procedures to the processing system and while the new

people are not yet 'up to speed' the FCC expects them to be by February.

The real purpose of the meeting was to acquaint industry people with the processes through which an application must travel, and to solicit comments on how those processes might be speeded up.

The bottom line most would **eventually hope for is no processing at all**; simply a filing or notification system wherein the FCC is 'put on notice' when an applicant has a station constructed. However the FCC is not yet ready for that great leap forward so for now the suggestions accepted must deal with mundane things such as:

- 1) The FCC, on form 430 (application for an earth terminal), asks that the applicant file 'Articles Of Incorporation'. There seems to be no good reason for this requirement for CATV TVRO's; it is a hold over from the Common Carrier's licensing of transmit facilities where the family tree of the applicant is of some concern. The FCC still requires this for now, but they indicated this could change.
- 2) The FCC requires a fairly detailed financial showing (see CATJ for December, 1977 'Preparing And Filing TVRO Applications'). Again, this is a hold over from licensing transmit facilities where the FCC is concerned that if a common carrier transmitter is licensed, to serve some public need, that it will be backed by sufficient bucks to insure that the public needs do in fact get served. There seems to be no good reason to continue this procedure for television receive only facilities; for now it continues, but look for a 'relaxation here' by say February.
- 3) The block diagrams we all submit with our applications tend to look alike. Somebody like Randy Renner of Prodelin once made up one and then everyone copied it. There seems to be no good reason to include it in the first place.
- 4) The same could be said for the site sketch (vertical sketch). When you've seen one, you've seen them all.
- 5) The site location map seems redundant. They already have your geographic coordinates, and a copy of a copy of a USGS 7.5 minute scale map that pinpoints the location is simply extra weight. Half the applications have been using local gasoline company road maps (and getting by successfully). If a map is required, why can't the great circle study maps prepared by the frequency coordinator fulfill the requirement? It is attached anyhow.

The FCC is aiming at a February deadline by which time they hope to 'formally' modify some of these requirements for TVRO applications. We'll

keep you advised, but in the interim, keep on sending in all of that useless paper. Just think of all of the extra make-work you are creating for the FCC. They get to handle dozens of extra, needless sheets with each application, filing them and making microfilm of them and simply allowing them to take up more and more room. That's the stuff government does best so don't let them down boys!

Transponder Musical Chairs

Last month's Coop's Cable Column reported on the latest 'line-up' of transponders for RCA's F2 (SATCOM II) bird. Well friends in TVRO land, things have changed again. So let's try to sort it out one more time:

- 2 PTL (*)
- 4 SHOWTIME east/central
- 6 WTCG/WTBN (**)
- 8 CBN
- 10 SHOWTIME mountain/west
- 12 'Broken'
- 14 RCA data, reserved (***)
- 16 Fanfare (****)
- 18 KTVU (*****)
- 20 HBO mountain/west
- 22 Madison Square Garden
- 24 HBO east/central

*PTL has been moved to 2 from 18, scheduled to start around 1-1-78. **WTCG has applied to FCC for new call letters, WTBN (no other change); **RCA data moved to 14 from 2 effective with PTL start up; ****Fanfare due to start 2-1-78, see report in Technical Topics; *****KTVU now formal for 8-1-78 start under **Holiday Satellite Systems** as common carrier. Holiday is joint venture of Ed Taylor's SSS and Holiday Inns of America. Details next month.

A decision from RCA on the F2/F1 move is expected probably before you read this (see **Coop's Cable Column** here this month). The 14 and 18 'allocations' are, according to RCA, 'subject to further change'.

100° K Now Standard

Scientific Communications, Inc. (3425 Kingsley, Garland, Texas 75041) has announced that a 100 degrees Kelvin noise temperature LNA is now standard in their product line. SCI offered one of (if not the) first 120 degree K units to the CATV industry early in 1977, following that up with a 110 degree K unit. The new model is the SCF-395-507 (50 dB of gain) and delivery is from stock to 60 days starting this month.

The 100 degrees K noise figure is a guaranteed number; a curve supplied by SCI to CATJ shows a 'typical' noise figure curve of from 90 degrees K at 3.7 GHz to under 90 degrees across to 4.15 GHz, rising to around 95 degrees K at 4.2 GHz. 90 degrees K corresponds to a real-world noise figure of 1.18 dB (see **CATJ** for September 1977, page 19).

PBS Start Update

The Public Broadcasting System's use of WESTAR I for program relay was scheduled to begin on January 1. How-

ever, the kick off of the system is on a limited (although full time) basis.

Under the terms of the Western Union and PBS agreement, the exact channel assignment (i.e. transponder) for PBS is 'flexible'. That is, the channels where you find them today may not be the channels where you find them tomorrow. In actual fact the channels will not change frequently, nor without some notice to all (legally involved) parties. But—WU does have the option of moving the PBS channel assignments around.

The **January 1 start date** was to have been on a **single** transponder only; and the four presently set aside for PBS are transponders 7, 8, 9 and 12. There is more (good) news as well; WU will utilize the 6.8 MHz aural sub-carrier format for PBS rather than the earlier WU 'standard' of 6.2 MHz (see Coop's Cable Column in December 1977 **CATJ**). Neither WU nor PBS seem to know when the full compliment of four PBS

transponders will be in service, or, how the three not put into service on January 1 will be phased into service.

W/U Aural Sub-Carriers

Western Union has been utilizing three separate aural sub-carriers for video plus audio format traffic on both WESTAR I and II. Until recently their 6.2 aural sub-carrier has been the most frequently utilized, although there is some indication that this may change or be changing.

A source at Western Union indicates that in the future WU will 'probably' reserve the 6.2 aural sub-carrier for older, established customers who already have their receiving gear in place; but that newer customers will utilize the 6.8 MHz aural sub-carrier. WU also utilizes a 5.9 MHz aural sub-carrier from time to time, especially for contract video with which the contract customer wishes to have additional 'security' from other satellite users.

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- 2) Member-systems pay regular dues to CATJ on a monthly basis; Associate members pay a one time annual fee; individual members pay a one time annual fee of \$25.00 per year;
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- 4) **Deadlines** are the 15th of each month for the following month's issue.
- 5) **Terms** for non-members is **full payment with order** (no invoicing).
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TECHNICIAN WANTED

MSO needs technician for mainly Jerrold System. Send resume to:

OVC Telecommunications, Inc.
114 E. Reynolds Road
Lexington, KY 40503

Attn: Gary Knaus

FOR SALE new Philco VHF/UHF converter G8000. Also reconverts UHF to VHF. Use as head end converter feed UHF TV and VHF \$65. Philco auto-level UHF sweep-generator G8002, as new, aligns preamps, converters, traps, etc. \$100 FOB UPS. Both cost \$475. Spitz. Box 4095, Arlington, VA 22204

1000 CONVERTERS—single channel (D to 3) with PG key feature. Also, 3 Scientific Atlanta 6300 modulators for the above converters. Contact Bob Williams, Perry Cable Television Co. at 305-334-7400.

SEVERAL NEW ANTENNA COAXIAL RELAYS, SPDT, gold plated contacts, go over 500 MHz, handle 150W RF commercial ratings, 12v DC operates, \$5 each. SPITZ, Box 4095, Arlington, Virginia 22204.

TVRO SYSTEM LOANS—If your cable system is considering installing a satellite earth receiving terminal, we may have a bank loan program for you. Systems located in Oklahoma, Arkansas, Louisiana, Texas, Kansas and New Mexico have used our services for new system construction, re-builds and system acquisition for nearly 15 years. We know and understand the cable TV business and if you are located in our area we'd like to talk with you concerning a loan for a TVRO. Contact Ken Bass or Clark Bass, First National Bank of McAlester, Box 948, McAlester, Ok. 74501 (918/426-0211).

CATA ASSOCIATES

In recognition of the untiring support given to the nation's CATV operators, and their never-ending quest for advancement of the CATV art, the COMMUNITY ANTENNA TELEVISION ASSOCIATION recognizes with gratitude the efforts of the following equipment and service suppliers to the cable television industry, who have been accorded ASSOCIATE MEMBER STATUS in CATA, INC.

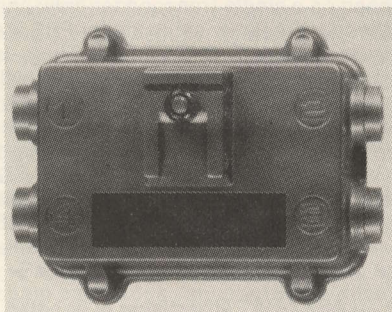
Wavetek Sweeper

Wavetek Indiana, Inc. (66 North First Ave., Beech Grove, IN. 46107) has released their new Model 1061 broadband RF sweeper. The unit covers 1-400 MHz, features pin diode leveling to control output flatness to within ± 0.25 dB and offers the provision for up to six crystal controlled (birdy bypass) markers. Markers may be adjusted from 2 mV to 2V peak to peak and over a display width range of from 100 to 400 kHz. Frequency accuracy of the markers is 0.005%.

The 1061 family of sweepers is available in either 75 or 50 ohms. Full data is available from the company. Price is \$625.00.

Power Pass From RMS

RMS Electronics, Inc. (50 Antin Place, Bronx, New York 10462) has announced the immediate availability



of a new series of power passing passive line equipment.

The 'Unipower' series of equipment covers (power passing) line splitters, directional couplers and power inserters. The new equipment employs an integrated circuited miniaturized hybrid network which according to RMS greatly reduces hazards associated

with extreme temperature variations, mechanical line vibrations, and shock due to accidental abuse.

Each output leg is individually fused with a 15 amp fuse that can be removed to cut power feed-thru on any selected port. Fuses larger than 15 amps can also be utilized. The fuse—'switching' eliminates previous problems with physical cutting of RF/DC choke coils.

Included in the new 'Unipower' line is a three-way power passing splitter (CA-3603), two-way power passing splitter (CA-3602), power passing directional couplers (CA-3808, etc.) with isolation values from 8 dB to 16 dB, and a power inserter (CA-3700).

New S/A Transformer

Scientific-Atlanta (3845 Pleasantdale Road, Atlanta, Georgia 30340) has a new 'versatile' transformer which

AEL, INC., CATV COMMUNICATIONS DIV., P.O. Box 552, Lansdale, PA 19446. (M1, S2) 215-822-2929
 Andrew Corp., 10500 W. 153rd St., Orland Park, IL 60462 (M2, M3, M9 Satellite Terminals) 312-349-3300
 ANIXTER-PRUZAN, INC., P.O. Box 88758, Tukwila Branch, Seattle, WA 98188, (D1) 206-251-6760
 Avantek, Inc., 3175 Bowers Avenue, Santa Clara, CA 95051 (M8) 408-249-0700
 Belden Corp., Electronic Division, Box 1327, Richmond, IN 47374 (M3) 317-966-6661
 BESTON ELECTRONICS, INC. 903 South Kansas Ave., Olathe, KS 66061 (M9) Character Generators-913-764-1900
 BLONDER-TONGUE LABORATORIES, One Jake Brown Rd., Old Bridge, N.J. 08857 (M1, M2, M4, M5, M6, M7) 201-679-4000
 BROADBAND ENGINEERING, INC., 535 E. Indiantown Rd., Jupiter, FL 33458 (D9, replacement parts) 305-747-5000
 CALIFORNIA MICROWAVE, INC., 455 West Maude Ave., Sunnyvale, CA 94086 (M9 Satellite Terminals) 408-732-4000
 CATEL, 1400-D Stierlin Rd., Mt. View, CA 95043, (M4, M9) 415-969-9400
 CCS HATFIELD/CATV DIV. 5707 W. Buckeye Rd., Phoenix, AZ 85063 (M3) 201-272-3850
 C COR ELECTRONICS, Inc., 60 Decibel Rd., State College, PA 16801 (M1, M4, M5, S1, S2, S8) 814-238-2461
 COLLINS COMMERCIAL TELECOMMUNICATIONS, MP-402-101, Dallas, TX 75207, (M9, Microwave) 214-690-5954
 COMMUNICATIONS EQUITY ASSOCIATES, 651 Lincoln Center, 5401 W. Kennedy Blvd., Tampa, FL 33609 (S3) 813-877-8844
 COMM/SCOPE COMPANY, Rt. 1 Box 199A, Catawba, NC 28609, (M3) 704-241-3142
 ComSonics, Inc., P.O. Box 1106, Harrisonburg, VA 22801 (M8, M9, S8, S9) 703-434-5965
 C R C ELECTRONICS, INC., P.O. Box 855, Waianae, HI 96792, (M9 Videotape Automation Equipment) 808-668-1227
 DAVCO, INC., P.O. Box 861, Batesville, AR 72501 (D1, S1, S2, S8) 501-793-3816
 EAGLE COM-TRONICS, INC., 8016 Chatham Dr., Manlius, N.Y. 13104 (M9 Pay TV Delivery systems & products) 315-682-2650
 EALES COMM. & ANTENNA SERV., 2904 N.W. 23rd, Oklahoma City, OK 73107, (D1,2,3,4,5,6,7, S1,2, S7,8) 405-946-3788
 FARINON ELECTRIC, 1691 Bayport, San Carlos, CA 94070 (M9, S9) 415-592-4120
 FEDERAL BROADCASTING CO. 600 Fire Rd. Box 679 Pleasantville, N.J. 08232 (D9, S9)
 FERGUSON COMMUNICATIONS CORP., P.O. Drawer 871, Henderson, TX 75652 (S1, S2, S7, S8, S9) 214-854-2405
 FRANK L. CROSS & ASSOCIATES, INC., 5134 Melbourne Dr., Cypress, CA 90630, (M9) 714-827-0868
 GILBERT ENGINEERING CO., P.O. Box 14149, Phoenix, AZ 85063 (M7) 602-272-6871
 GTE SYLVANIA, 3046 Covington Rd., Marietta, GA 30062 (M1,D1) 404-003-1510
 HUGHES MICROWAVE COMMUNICATIONS PRODUCTS, 3060 W. Lomita Blvd., Torrance, CA. 90505, (M9) 213-534-2146.
 HOME BOX OFFICE, INC., 7839 Churchill Way—Suite 133, Box 63, Dallas, TX 75251 (S4) 214-387-8557
 I.T.T. SPACE COMMUNICATIONS, INC. 69 Spring St., Ramsey, N.J. 07446 (M9) 201-825-1600
 JERROLD Electronics Corp., P.O. Box 487, Byberry Rd. & PA. Turnpike, Hatboro, PA 19040, (M1, M2, M4, M5, M6, M7, D3, D8, S1, S2, S3, S8) 215-674-4800
 JERRY CONN ASSOCIATES, INC., P.O. Box 444, Chambersburg, PA 17201 (D3, D4, D5, D6, D7, D8) 717-263-8258
 LARSON ELECTRONICS, 311 S. Locust St., Denton, TX 76201 (M9 Standby Power) 817-387-0002
 LRC Electronics, Inc., 901 South Ave., Horseheads, N.Y. 14845 (M7) 607-739-3844
 Magnavox CATV Division, 133 West Seneca St., Manlius, N.Y. 13104 (M1) 315-682-9105
 MICROWAVE ASSOCIATES, INC. 10920 Ambassador Drive Suite 119 Kansas City, MO 64153 (M9) Microwave Radio Systems 816-891-8895
 MICRODYNE CORPORATION, P.O. Box 1527, 627 Lofstrand La. Rockville, MD 20850, (M9 Satellite TV Recs.) 301-762-8500
 Microwave Filter Co., 6743 Kinne St., Box 103, E. Syracuse, N.Y. 13057 (M5, bandpass filters) 315-437-4529
 MID STATE Communication, Inc. P.O. Box 203, Beech Grove, IN 46107 (M8) 317-787-9426
 MSI TELEVISION, 4788 South State St., Salt Lake City, UT 84107 (M9 Digital Video Equip.) 801-262-8475
 NORTHERN CATV DISTRIBUTORS, INC., 8016 Chatham Dr., Manlius, N.Y. 13104 (D1) 315-682-2670
 OAK INDUSTRIES INC./CATV DIV., Crystal Lake, IL 60014 (M1, M9 Converters, S3) 815-459-5000

MEMBER SHOWCASE

New products and services

from the industry are the life-blood of the continual expansion and progress by the cable TV system operators throughout the world. Products and services reviewed here are new or 'recent' from CATA Associate Member firms; always good places to do business!

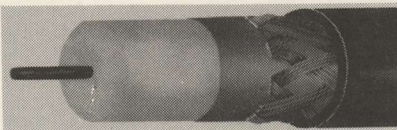
enables a CATV system operator to extend a present 30 volt system or replace outdated equipment on an on-going basis. The new 30/60 volt transformer is field changeable from either setting to the other with a recessed switch which is screwdriver adjustable.

Anixter-Prizan Moves

Anixter-Prizan, Inc. has announced a move to a new building in the South-center South industrial area of Seattle. The new structure offers A-P 'double the former space' and it has been designed 'from the ground up' to serve as a 'model distribution center'.

Doubling of space and improved distribution facilities will allow A-P to expand their growing line of CATV equipment; which now stands at some 7,500 separate items with the recent addition of the full Jerrold line of products. The mailing address for the new facility is P.O. Box 38758, Tukwila Branch, Seattle, Washington (98188).

The new inbound WATS Line for the western region is (800) 426-4948. The WATS Line for inbound calls from the east remains (800) 631-1166.



Laminated/Bonded/Drop Cable

Comm/Scope Company has a new series of laminated and bonded shielded drop cables. The BLPV series of cables (patent pending) incorporate an overlapped, laminated foil bonded to a polyethylene core. The new construction is said to provide improved connector assembly, a better moisture barrier, and provide a flexible cable which overcomes radial cracking evident in conventional bonded shield construction. The new construction is available in both RG6 and RG59 type

cables. Full details are available from Comm/Scope at P.O. Box 199-A, Rt. 1, Catawba, N.C. 28609.

Cable Prices Up

Systems Wire and Cable Inc. of Phoenix, Arizona has announced price increases on the firm's Gas Injected Dielectric and Sealmetic® cables. According to Nat M. Marshall, "continuing increases in raw material costs, in particular aluminum, has made it necessary to adjust our prices". Marshall does expect cable prices to stay at their present levels "for the remainder of the year".

S/A Headend Equipment to Flora

Scientific-Atlanta headend equipment has been chosen for the new Anna, Illinois CATV system that will also serve Jonesboro, Illinois. S/A will also supply the distribution equipment to Flora Cable TV; which operates in Flora and Salem, Illinois, and, Benton, Kentucky.

PRODELIN, INC., 1350 Duane Avenue, Santa Clara, CA. 95050 (M2, M3, M7, S2) 408-244-4720
Q-BIT Corporation, P.O. Box 2208, Melbourne, FL. 32901 (M4) 305-727-1838
RADIO MECHANICAL STRUCTURES, INC., P.O. Box 1277, Kilgore, TX 75662 (M2, M9, S2) 214-984-0555
R F SYSTEMS, INC., P.O. Box 428, St. Cloud, FL 32769, (M2, M6), 305-892-6111
RICHEY DEVELOPMENT CORP., 6920 Melrose, Oklahoma City, Ok. 73127 (M1, M4, M8, S8) 405-495-3953
RMS CATV Division, 50 Antin Place, Bronx, N.Y. 10462 (M5, M7) 212-892-1000
Sadelco, Inc., 299 Park Avenue, Weehawken, N.J. 07087 (M8) 201-866-0912
Scientific Atlanta Inc., 3845 Pleasantdale Rd., Atlanta, GA. 30340 (M1, M2, M4, M8, S1, S2, S3, S8) 404-449-2000
SCIENTIFIC COMMUNICATIONS, INC., 3425 Kingsley Rd., Garland, TX 75041, (M4 Low Noise & Parametric) 214-271-3685
SITCO Antennas, P.O. Box 20456, Portland, OR. 97220 (D2, D3, D4, D5, D6, D7, D9, M2, M4, M5, M6, M9) 503-253-2000
Systems Wire and Cable, Inc., P.O. Box 21007, Phoenix, AZ. 85036 (M3) 602-268-8744
TERRACOM, 9020 Balboa Ave., San Diego, CA 92123, (M9 Microwave Earth Stations) 714-278-4100
TEXSCAN Corp., 2446 N. Shadeland Ave., Indianapolis, IN. 46219 (M8, bandpass filters) 317-357-8781
Theta-Com, P.O. Box 9728, Phoenix, AZ. 85068 (M1, M4, M5, M7, M8, S1, S2, S3, S8, AML MICROWAVE) 602-944-4411
TIMES WIRE & CABLE CO., 358 Hall Avenue, Wallingford, CT. 06492 (M3) 203-265-2361
Titsch Publishing, Inc., P.O. Box 4305, Denver, CO. 80204 (S6) 303-573-1433
Tocom, Inc., P.O. Box 47066, Dallas, TX. 75247 (M1, M4, M5, Converters) 214-438-7691
TOMCO COMMUNICATIONS, INC., 1077 Independence Ave., Mtn. View, CA 94043 (M4, M5, M9) 415-969-3042
Toner Cable Equipment, Inc., 418 Caredean Drive, Horsham, PA. 19044 (D2, D3, D4, D5, D6, D7) 215-675-2053
Triple Crown Electronics Inc., 42 Racine Rd., Rexdale, Ontario, Canada M9W2Z3 (M4, M8) 416-743-1481
TURNER COMMUNICATIONS CORP., (WTCG-TV), P.O. Box 4064 Atlanta Stadium, Atlanta, GA. (S9) 404-522-7250
UNITED PRESS INTERNATIONAL, 220 East 42nd St., New York, N.Y. 10017, (S9) (Automated News Svc.) 212-682-0400
UNITED STATES TOWER & FAB. CO. P.O. Drawer "S", Afton, OK 74331 (M2, M9) 918-257-4257
Van Ladder, Inc., P.O. Box 709, Spencer, Iowa 51301 (M9, automated ladder equipment) 712-262-5810
VIDEO DATA SYSTEMS, 40 Oser Avenue, Hauppauge, N.Y. 11787 (M9) 516-231-4400
VITEK ELECTRONICS, INC., 200 Wood Ave., Middlesex, N.J. 201-469-9400
WAVETEK Indiana, 66 N. First Ave., Beech Grove, IN. 46107 (M8) 317-783-3221
WEATHERSCAN, Loop 132 - Throckmorton Hwy., Olney, TX. 76374 (D9, Sony Equip. Dist., M9 Weather Channel Displays) 817-564-5688
Western Communication Service, Box 347, San Angelo, TX. 76901 (M2, Towers) 915-655-6262/653-3363

NOTE: Associates listed in bold face are Charter Members

Distributors:

D1—Full CATV equipment line
D2—CATV antennas
D3—CATV cable
D4—CATV amplifiers
D5—CATV passives
D6—CATV hardware
D7—CATV connectors
D8—CATV test equipment

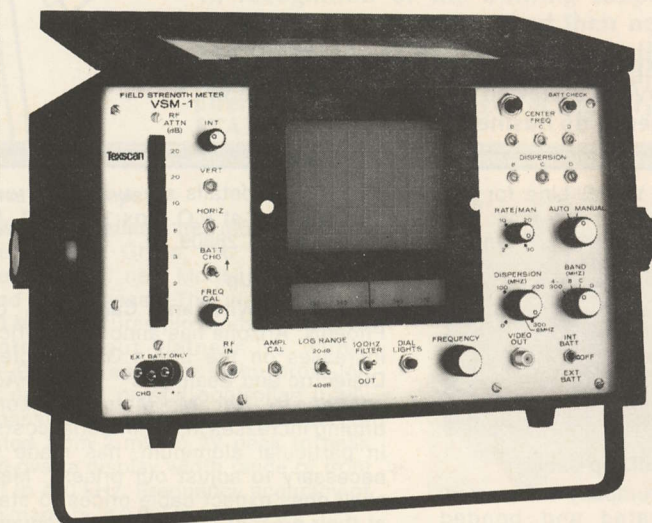
Manufacturers:

M1—Full CATV equipment line
M2—CATV antennas
M3—CATV cable
M4—CATV amplifiers
M5—CATV passives
M6—CATV hardware
M7—CATV connectors
M8—CATV test equipment

Service Firms:

S1—CATV contracting
S2—CATV construction
S3—CATV financing
S4—CATV software
S5—CATV billing services
S6—CATV publishing
S7—CATV drop installation
S8—CATV engineering

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* **2-Way Indoor Splitter** model DS-2F, \$1.10 each in lots of 100

* **F-59 Fittings with Ring**, 7.5 cents each in lots of 1,000

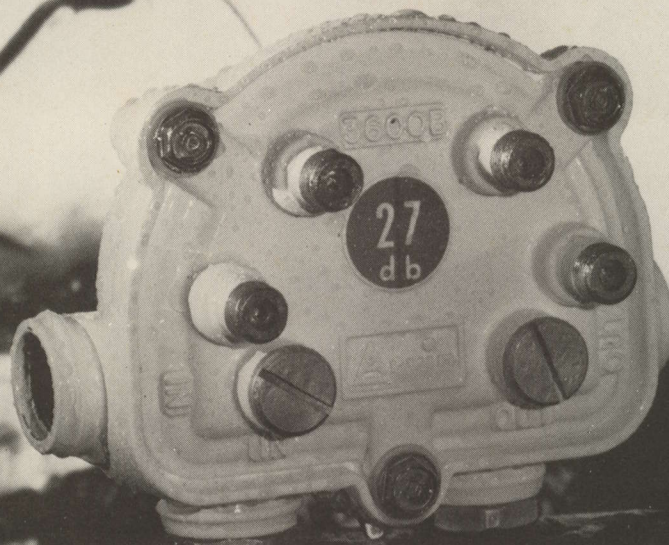
* **GF81 Fittings**, 18 cents each in lots of 100

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For Delivery—Call

Cablevision Equipment Company
Garland, TX 75042
214-272-8551

Signal Vision, Inc.
El Toro, CA 92630
714-586-3196

Comm-Plex Electronics
Montreal, Quebec CANADA H4P1V4
514-341-7440

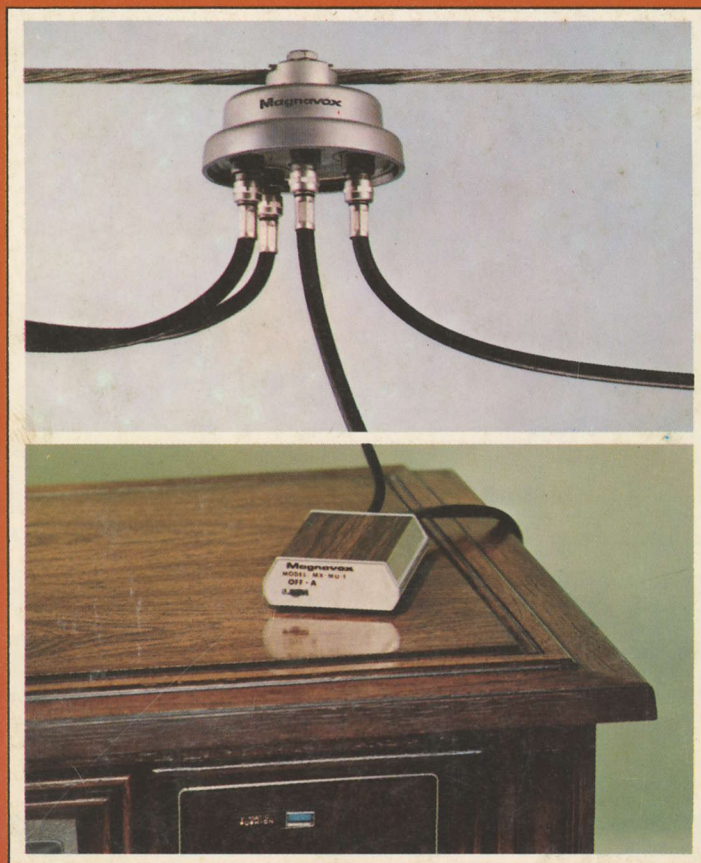
Emjay Electronics
Drexel Hill, PA 19026
215-284-6338

John Weeks & Assoc.
Lawrenceville, GA 30245
404-963-7870

The Most Popular Descrambler



...now comes in a High Security version



Introducing the new, doubly secure, Magnavox Descrambler II.

If the first descrambler looks familiar, it's probably because you've met. Our Magnavox MX-MU-1 Descrambler has become an industry standard since its introduction a year ago. Now, meet the next industry standard—Magnavox's new Descrambler II. An unbeatable combination of low price and high security, in a 2-unit descrambler.

The new Magnavox Descrambler II is doubly secure, because it offers 2-unit protection. Your subscriber has access to his set top unit only—essentially an on-off switch. If he moves, and takes his set top unit with him, you lose an on-off switch, not a descrambler. More important, if he moves and gives his set top unit to a neighbor, you won't be supplying free service. That's because the descrambling electronics are housed within the aerial mount activator, mounted on the pole or wire outside.

And the new Descrambler II not only costs less than its main competitor, it can do more. Each new Magnavox aerial mount activator serves **two** subscribers*. Most competitive units serve only one.

For more information on how the new Magnavox Descrambler II can give you effective Pay TV security, economically, contact: Magnavox CATV Systems, Inc., 133 West Seneca Street, Manlius, New York 13104; toll free, east of the Mississippi: 800-448-9121; west: 800-448-5171, or: 315-682-9105.

*Magnavox also offers a compact, single subscriber aerial mount activator.

Magnavox